Efka dc 1550

CONTROL DA321G5321

INSTRUCTION MANUAL

No. 402313 **English**

Efka
FRANKL & KIRCHNER
GMBH & CO KG

Efka
EFKA OF AMERICA INC.

Efka
EFKA ELECTRONIC MOTORS
SINGAPORE PTE. LTD.

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1 Range of Applications

The drive is suitable for lockstitch machine Dürkopp Adler model 867.
Furthermore, stepping motor operation is possible in connection with the Efka control SM210A. See connection scheme in the List of Parameters.

1.1 Use in Accordance with Regulations

The drive is not an independently operating machine, but is designed to be incorporated into other machinery by specially trained personnel.
It must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the EC Directive (Appendix II, paragraph B of the Directive 89/392/EEC and supplement 91/368/EEC).

The drive has been developed and manufactured in accordance with the relevant EC standards:

EN 60204-3-1:1990 Electrical equipment of industrial machines:
Particular requirements for industrial sewing machines, sewing units and sewing systems.

Operate the drive only in dry areas.

CAUTION
When selecting the installation site and the layout of the connecting cable, the Safety Instructions must be followed with no exceptions.
Particular attention should be paid to maintaining the proper distance from moving parts!

2 Scope of Supply

1	Direct current motor	**DC1550**
1	Electronic control/power supply unit	**DA321G5321/N208**
1	Actuator	**EB301A**
1	Accessory kit (standard) consisting of:	**B158** Plastic bag for B156 + documentation

Option1

1	Accessory kit consisting of:	**B156** Plastic bag for B156 + documentation

Option2

1	Accessory kit consisting of:	**B159** Plastic bag for B159, documentation and motor mount parts
1	Additional accessory kit consisting of:	**Z54** Pitman rod 400...700mm long Bracket for fastening EB3..

Note
If there is no metallical contact between drive (motor) and machine head, the potential equalization cord supplied with the unit is to be wired from the machine head to the terminal provided on the control box!

2.1 Special Accessories

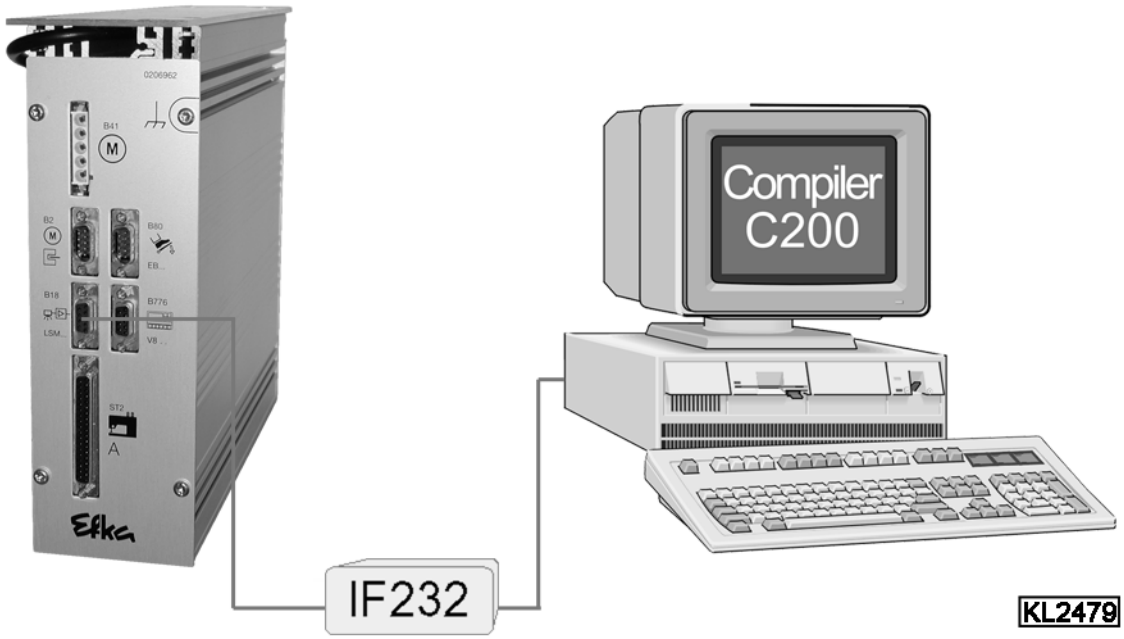
Control panel Variocontrol V810	- part no. 5970153
Control panel Variocontrol V820	- part no. 5970154
Control panel Variocontrol V850	- part no. 5990159
Control panel Variocontrol V900 (only in conjunction with compiler programming)	- part no. 5990161
Reflection light barrier module LSM002	- part no. 6100031
Hall sensor module HSM001	- part no. 6100032
Pulse encoder IPG001	- part no. 6100033
EFKANET interface IF232-3, complete	- part no. 7900071
Adapter cord for the connection of light barrier module and Hall sensor module HSM001 or pulse encoder IPG001, or light barrier module, Hall sensor module HSM001 or pulse encoder IPG001 and EFKANET	- part no. 1113229
Actuating solenoid type EM1.. (for e. g. sewing foot lifting, backtacking, etc.)	- see specification "solenoids" for available models
Extension cable approx. 1000 mm long for commutation transmitter DC15..	- part no. 1113151
Extension cable approx. 1000 mm long for DC15.. line	- part no. 1113150
Potential equalization cord 700 mm long, LIY 2.5 mm^2, grey, with spades on both sides	- part no. 1100313
Foot control type FB302 with three pedals for standing operation, with approx. 1400 mm connecting cable and plug	- part no. 4170025
Fitting piece for position transmitter	- part no. 0300019
Knee switch type KN3 (pushbutton) with cord of approx. 950 mm length without plug	- part no. 5870013
Knee switch type KN19 (pushbutton) with cord of approx. 450 mm length without plug	- part no. 5870021
Undertable mounting kit for DC15..	- part no. 1113235
Undertable mounting kit (reinforced) for DC15..	- part no. 1113427
Sewing light transformer	- please indicate line voltage and sewing light voltage (6,3V or 12V)
9-contact SubminD male connector	- part no. 0504135
9-contact SubminD female connector	- part no. 0504136
Half-shell housing for 9-contact SubminD	- part no. 0101523
37-pin SubminD male connector, complete	- part no. 1112900
Single pins for 37-pin SubminD with strand of 5cm length	- part no. 1112899

3 Use of the C200 Compiler

The Efka C200 Compiler is a software tool for the programming of upgrade control functions.
In addition to operation with or without the V810, V820 and V850 control panels, the easy-to-use V900 touchscreen panel can also be used for compiler programming.

The Compiler provides the following basic functions:

- predetermined functions which are integrated by means of a system file
- approx. 64kB for user programs and data
- error management routine with automatic error marking
- loader for program storing in the control
- a multi-tasking time sharing mechanism



The control (socket B18) and the computer (socket com1) are connected by means of interface IF232-3.

Set of special C200 Compiler accessories consisting of: order no. 1113262
- **C200 Compiler Software CD-ROM**
- **C200 Compiler User Manual**
- **EFKANET IF232-3 Interface**

See C200 Compiler user manual for more information on programming and use of control commands!

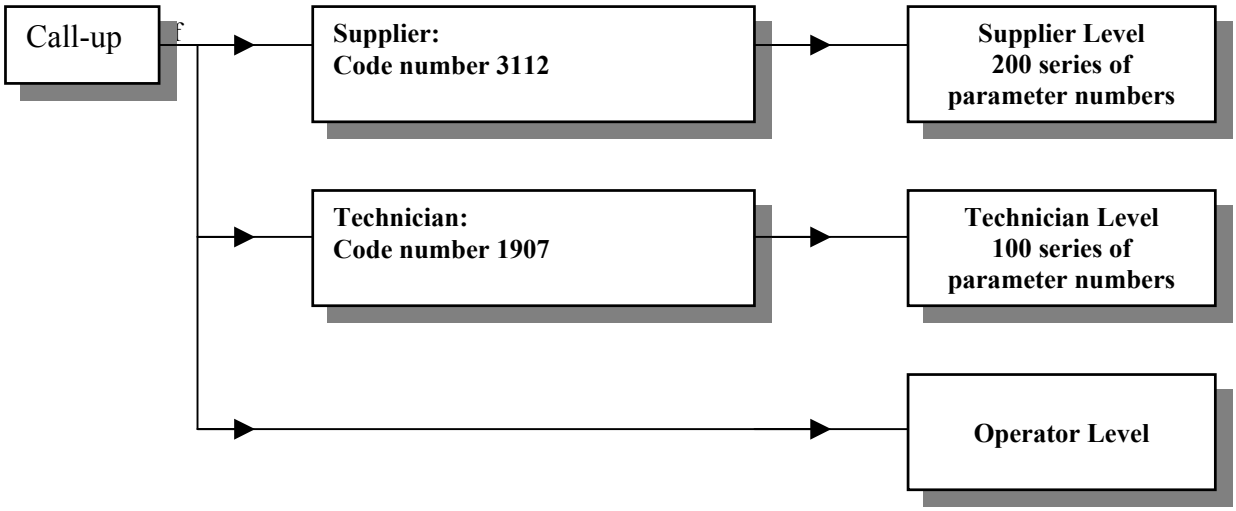
4 Control Operation

Functions can be set and parameters can be programmed without the control panel or with the V810, V820 or V850 control panel.
Additional programming using the Efka Compiler C200 software is possible with or without the control panel and with the complementary easy-to-use V900 touchscreen panel.

4.1 Access Authorization upon Command Input

In order to prevent unintentional changes of preset functions the command input is distributed at various levels.

The following persons have access:
- the supplier from the highest level down using a code number
- the technician from the next level down using a code number
- the operator at the lowest level without using a code number



4.2 Operation without Variocontrol

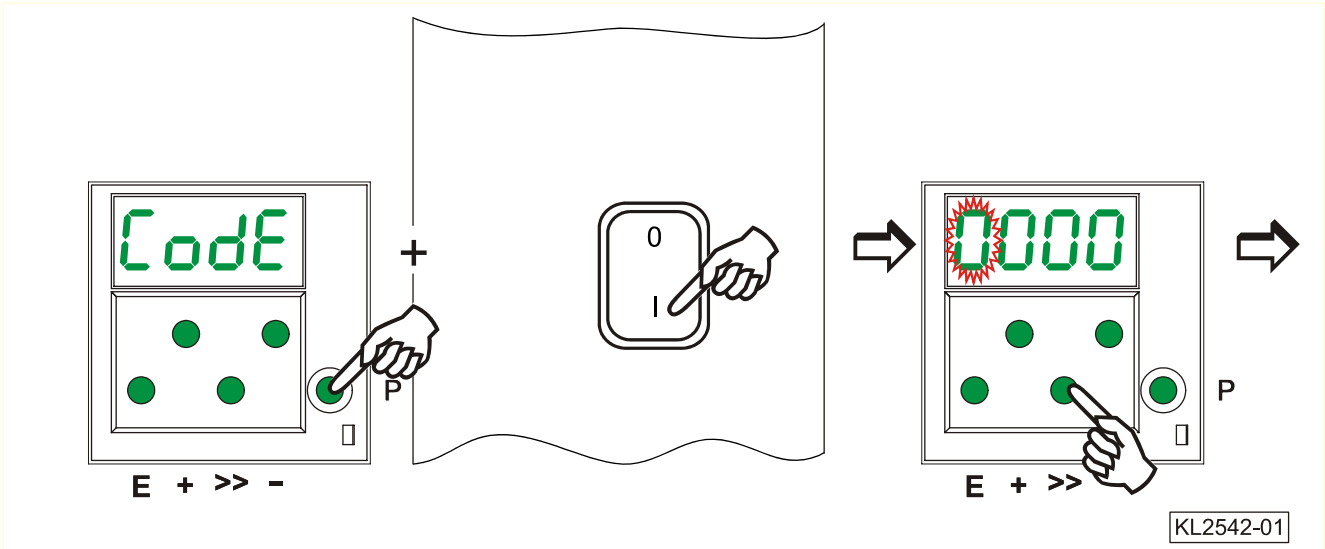
4.2.1 Code Number Input

Conventions of the display representation

- If there are **no** dots between the digits, a **value** is displayed.
- If there **are** dots between the digits, a **parameter number** is displayed.

1. Press the **P** key and turn power on

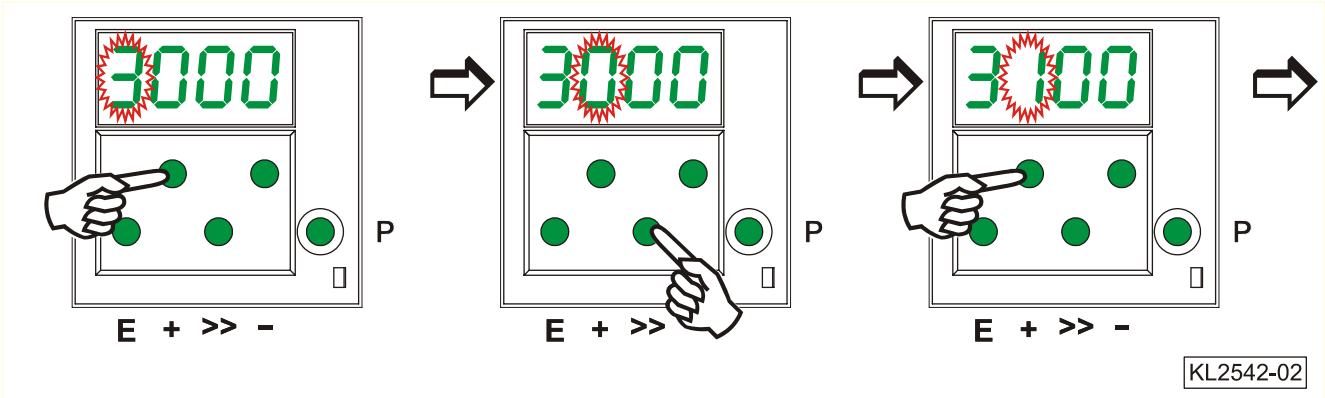
2. Press key **>>** (1st digit blinks)



3. Press key **+/–** to select the 1st digit
Technician level ➔ Code no. 1907
Supplier level ➔ Code no. 3112

4. Press key **>>** (2nd digit blinks)

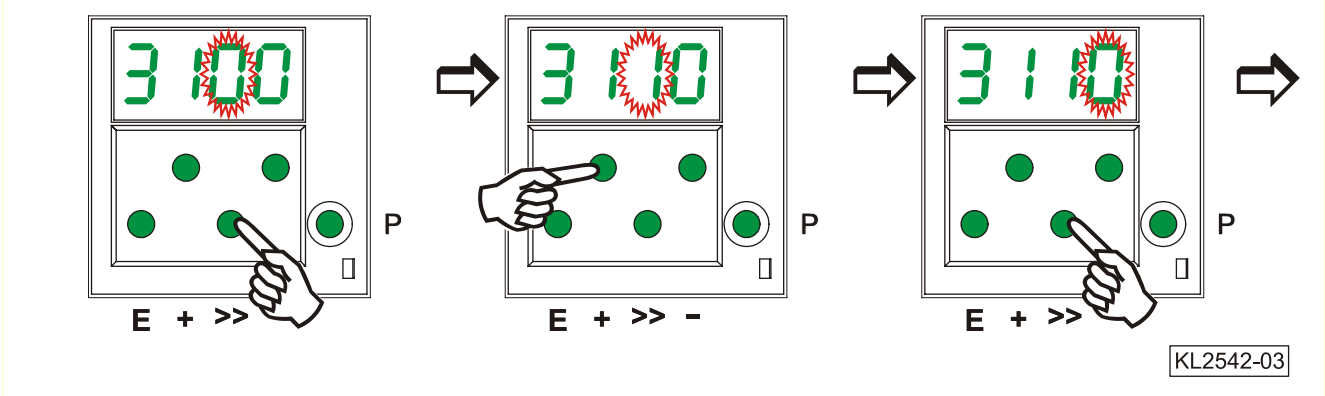
5. Press key **+/–** to select the 2nd digit



6. Press key **>>** (3rd digit blinks)

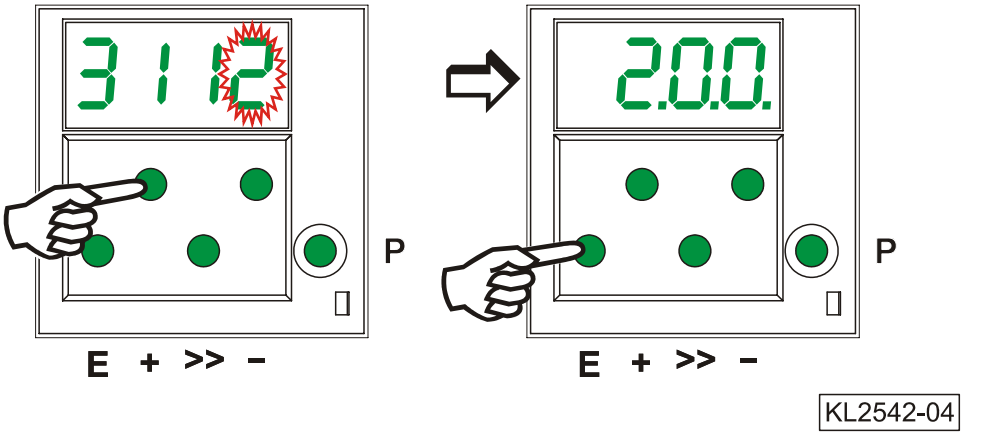
7. Press key **+/–** to select the 3rd digit

8. Press key **>>** (4th digit blinks)



9. Press key **+/–** to select the 4th digit

10. Press the **E** key. The **parameter number** is displayed.



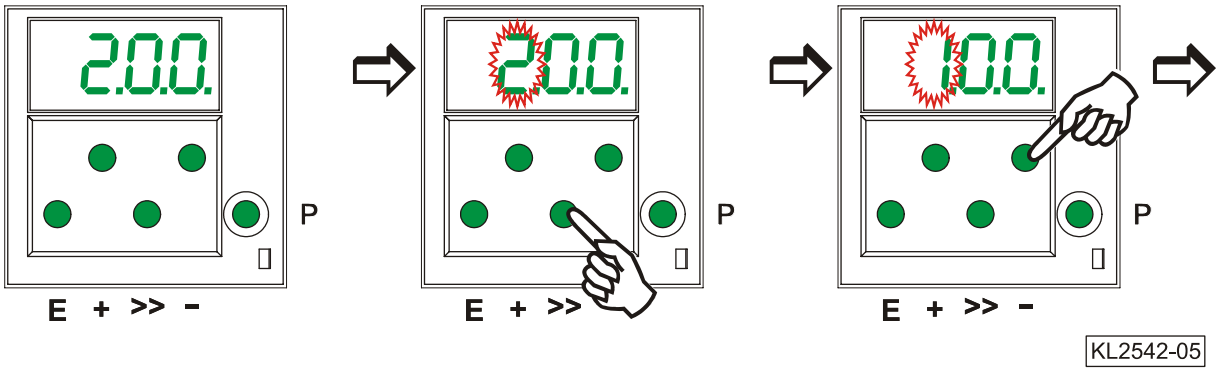
4.2.2 Parameter Setting

4.2.2.1 Direct Selection of Parameter Number

1. Display after code number input at the programming level

2. Press key **>>** (1st digit blinks)

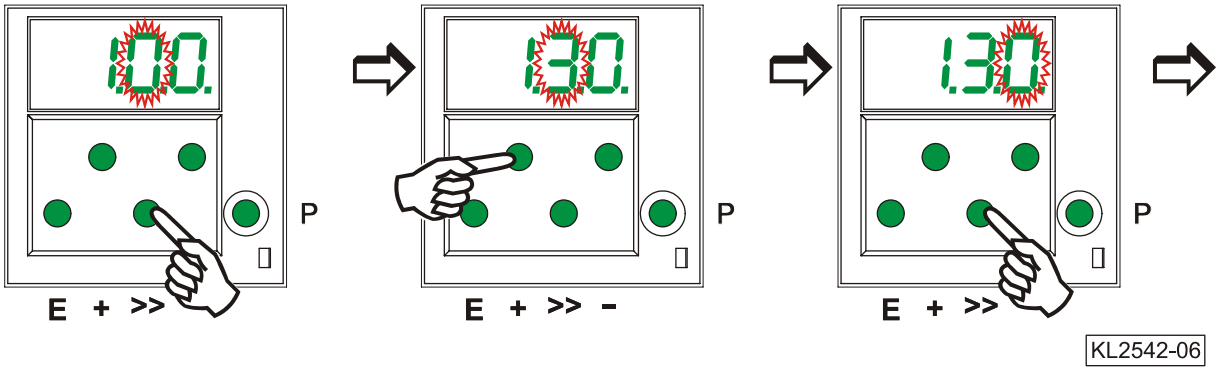
3. Press key **+/–** to select the 1st digit



4. Press key **>>** (2nd digit blinks)

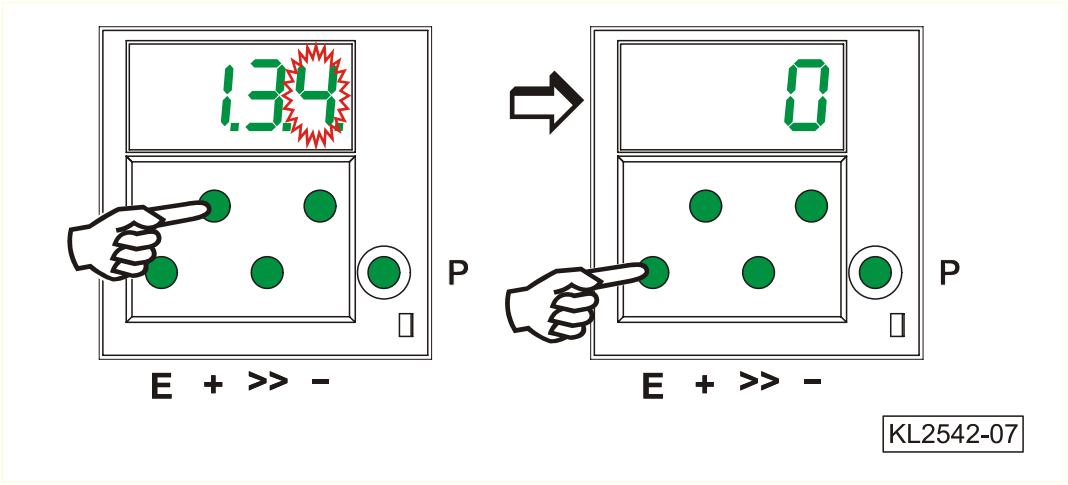
5. Press key **+/–** to select the 2nd digit

6. Press key **>>** (3rd digit blinks)



7. Press key **+/–** to select the 3rd digit

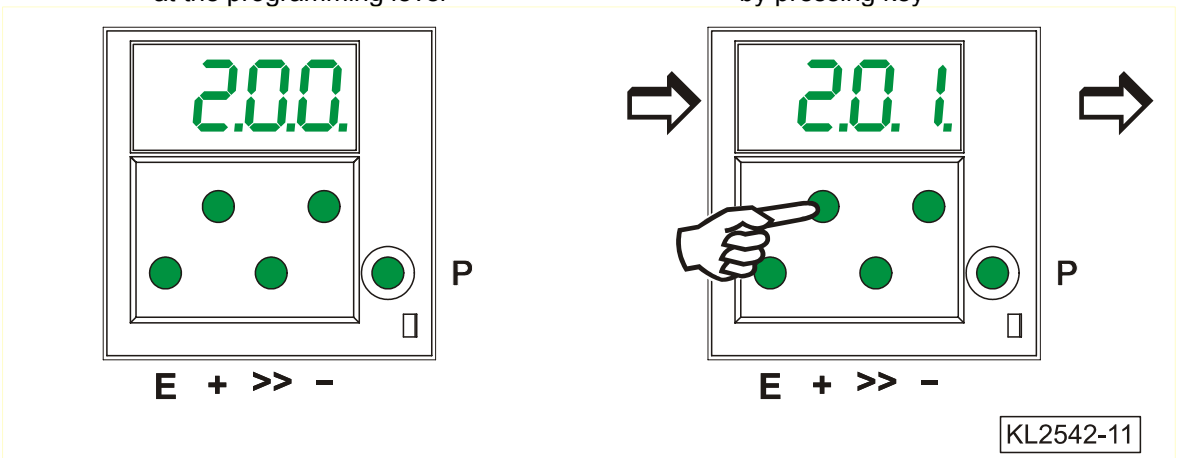
8. Press the **E** key. The parameter value is displayed.



4.2.2.2 Parameter Selection Using Key +/-

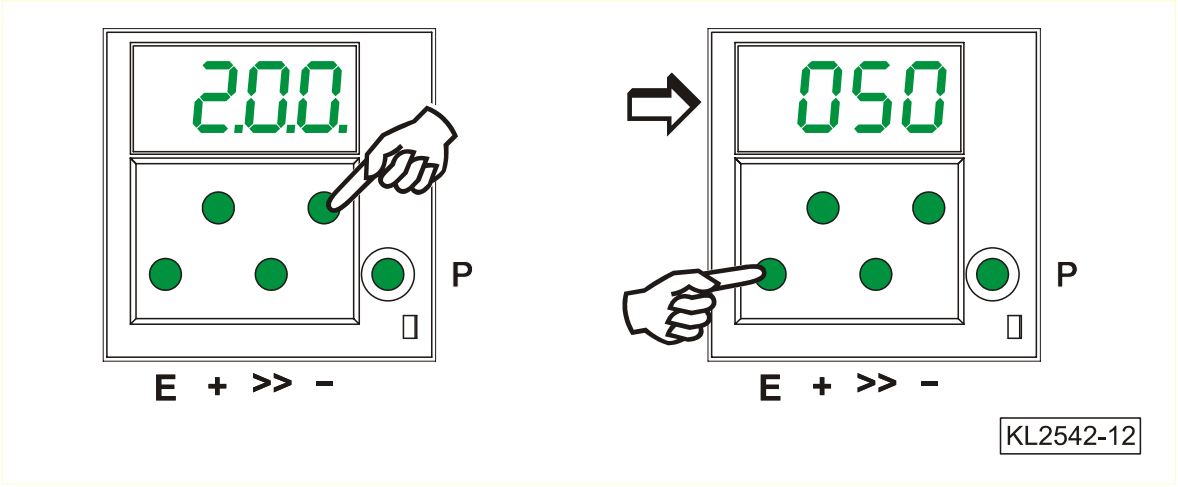
1. After code number input at the programming level

2. Select the next parameter by pressing key **+**



3. Select the previous parameter by pressing key –

4. After pressing the **E** key, the parameter value is displayed

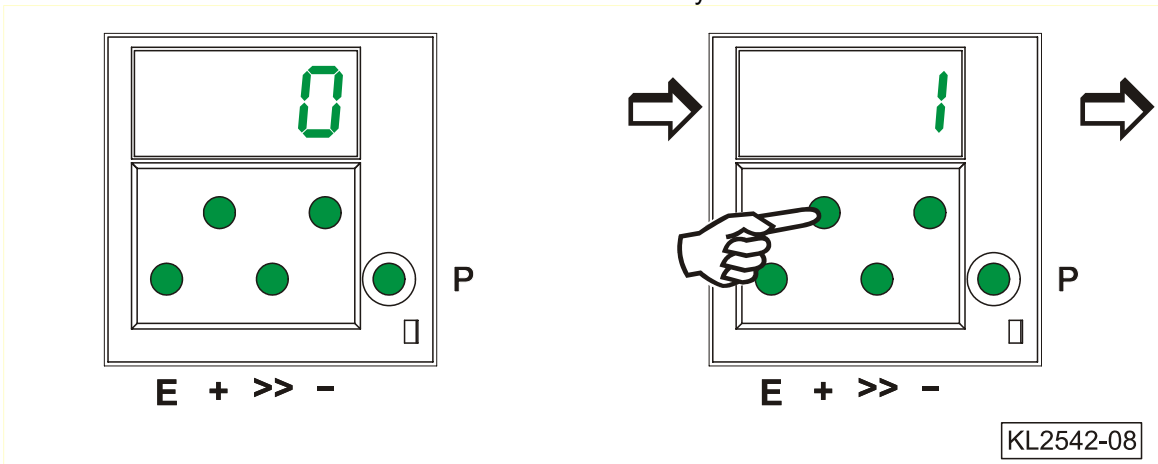


Note:
Varied parameter values will be saved only after you have started sewing or by varying parameter 401 (see chapter “Immediate Storage of All Data Changes“).
If the power is turned off before parameter values have been saved, the previous values are effective.

4.2.2.3 Changing Parameter Values

1. Display after parameter value selection

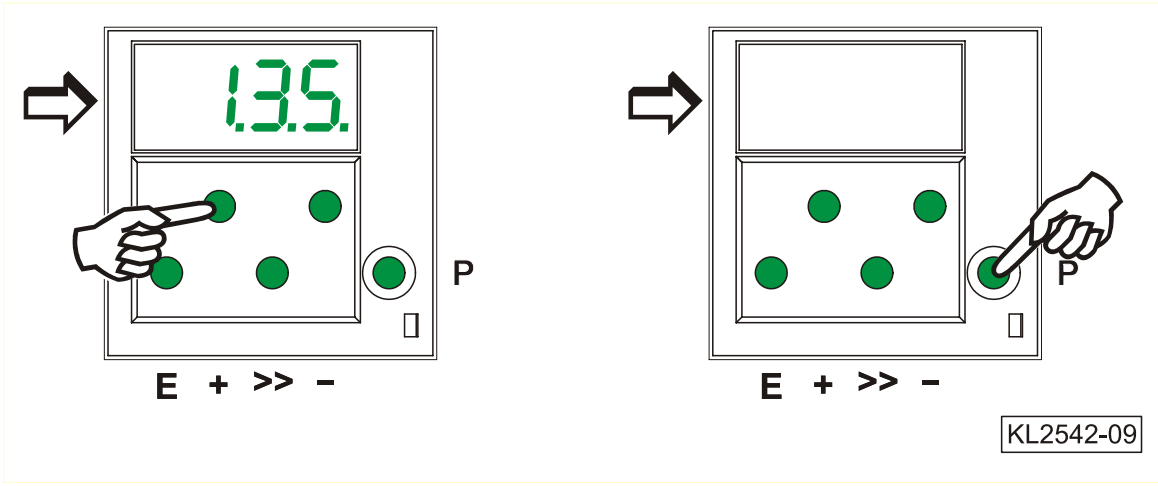
2. Change the parameter value by pressing key **+/-**



Option 1

Press the **E** key. The **next** parameter number is displayed.

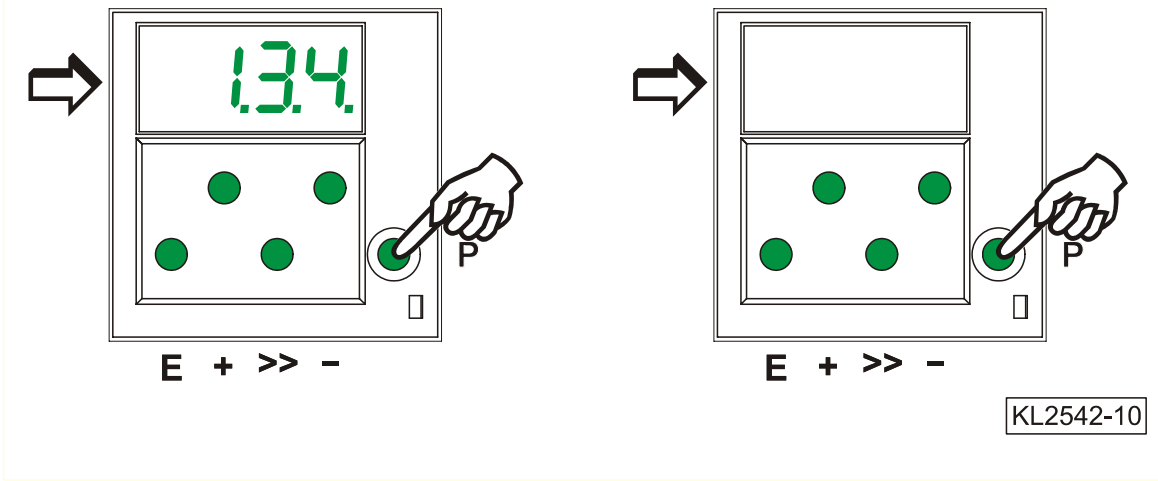
Press the **P** key. Exit programming.
The changed parameter values will be saved when you start sewing again.



Option 2

Press the **P** key. The **same** parameter number is displayed.

Press the **P** key. Exit programming.



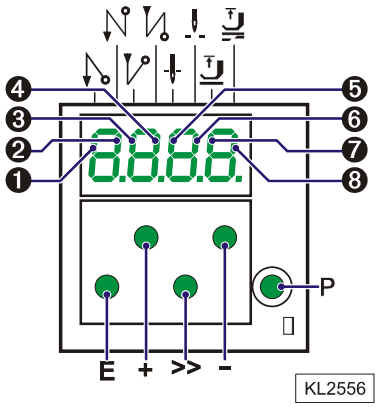
4.2.2.4 Immediate Storage of All Changed Data

Functions		Parameter
Immediate storage of all changed data	(EEP)	**401**

- Input code number 3112 after power On ➔ Press the **E** key
- Input parameter 401 ➔ Press the **E** key
- Set display from **0** to**1** ➔ Press the **E** or **P** key
- All data are stored!

4.2.3 Changing All Parameter Values at the Operator Level

All parameter values at the operator level can be changed without code number input (see List of Parameters).



- Press the **P** key ➔ The first parameter number will be displayed
- Press the **E** key ➔ The parameter value will be displayed
- Press the +/- keys ➔ The parameter value will be changed
- Press the **E** key ➔ The next parameter will be displayed
- Press the **E** key ➔ The parameter value will be displayed
- Press the +/- keys ➔ The parameter value will be changed
  etc.
- Press the **P** key twice ➔ Exit programming at the operator level

4.2.4 Function Switchover

Switchable functions can be changed by pressing the appropriate key.
The switching state is signaled by the upper vertical segments of the 4 digit numerical display.
In the above illustration, these segments are numbered from 1…8.

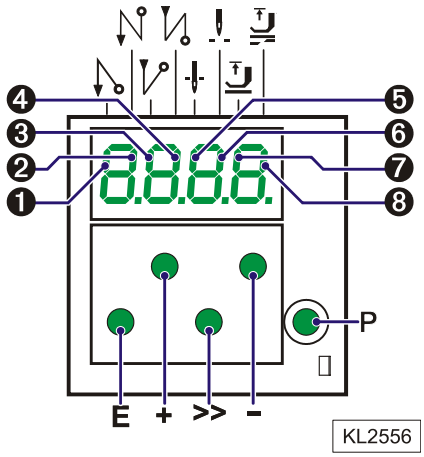
Table: Assignment of functions to the keys and segments of the numerical display

Function	**Key**		**Segment number**	
Single start backtack	**E**	(S2)	1 = on	2 = off
Double start backtack	**E**		1 = off	2 = on
Start backtack Off	**E**		1 = off	2 = off
Single end backtack	**+**	(S3)	3 = on	4 = off
Double end backtack	**+**		3 = off	4 = on
End backtack Off	**+**		3 = off	4 = off
Sewing foot lift at stop in the seam (automatic)	**-**	(S4)	5 = on	6 = off
Sewing foot lift at the seam end (automatic)	**-**		5 = off	6 = on
Sewing foot lift at stop in the seam and at the seam end (automatic)	**-**		5 = on	6 = on
Sewing foot lift (automatic) Off	**-**		5 = off	6 = off
Basic position down (position 1)	**>>**	(S5)	7 = on	8 = off
Basic position up (position 2)	**>>**		7 = off	8 = on

4.2.5 Direct Input of Maximum Speed Limitation

The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level on the control operator panel.
The actual value is shown on the display and can be changed using key +/- during operation or at intermediate machine stop.

Important! If the speed is changed, it is saved only after trimming and when you start sewing again.



4.2.6 Program Identification

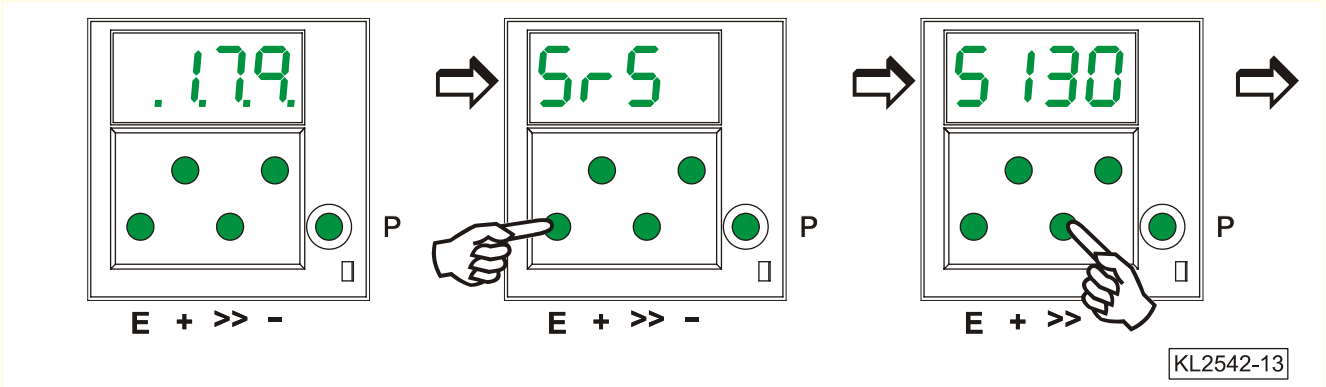
Function **without** control panel	Parameter
Program number, modification index and identification number display	**179**

After having selected parameter 179, the following information (for ex.) is displayed successively:

1. Select parameter **179**.

2. Press the **E** key.
Sr5 is displayed.

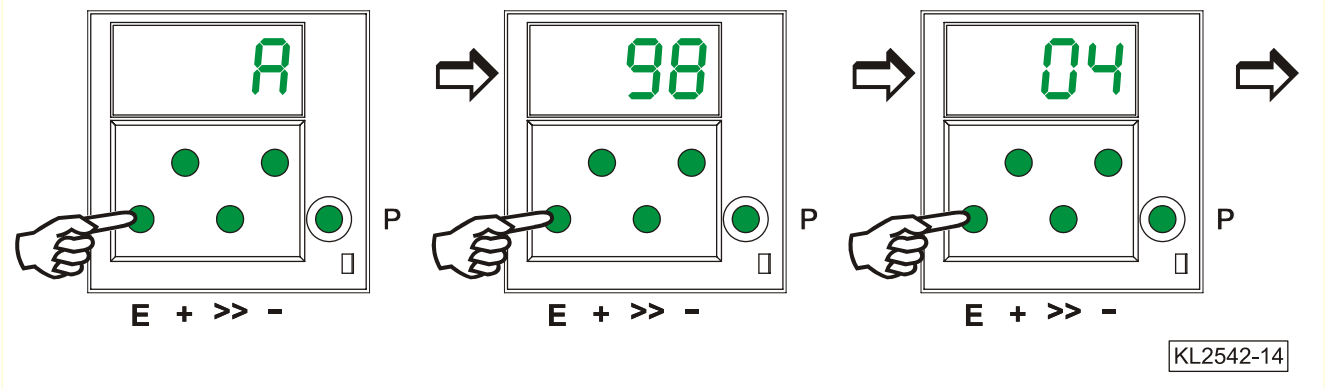
3. Press key **>>**.
Display of program number (depending on type of control).



4. Press the **E** key.
The program modification index is displayed.

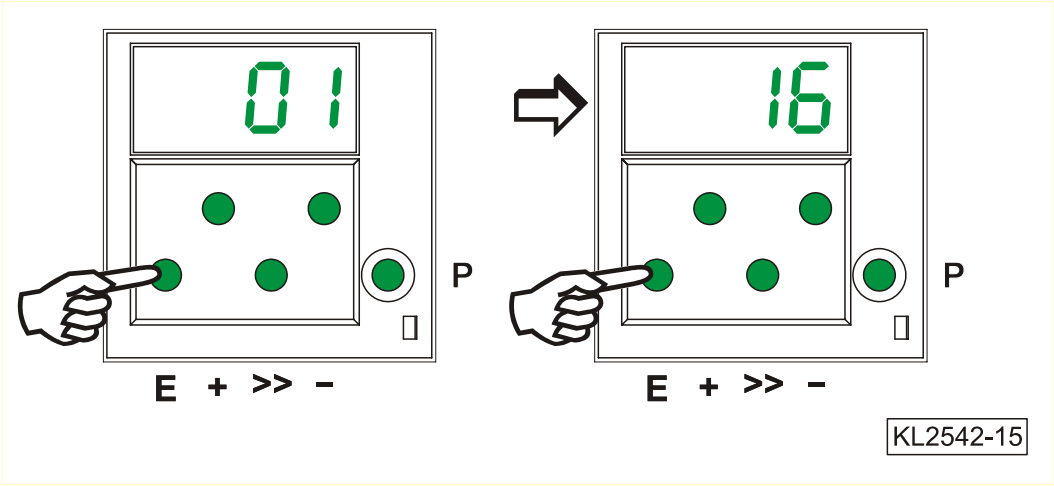
5. Press the **E** key.
The identification number digits 1 and 2 are displayed.

6. Press the **E** key.
The identification number digits 3 and 4 are displayed.



7. Press the **E** key.
The identification number digits 5 and 6 are displayed.

8. Press the **E** key.
The identification number digits 7 and 8 are displayed.



The routine is repeated by pressing the **E** key again.
Exit the routine after pressing the **P** key once. The next parameter number is displayed.
Exit programming after pressing the **P** key. The drive is again ready for sewing.

4.3 Operation Using Variocontrol V810, V820 or V850

4.3.1 Code Number Input on the V810

Technician Level Code Number => 1907 and Supplier Level Code Number => 3112

Example: Technician level CODE number selection on the V810 control panel

		TURN POWER OFF		
P	+	TURN POWER ON. First digit blinks.	→	C – 0000
+	-	Press key + or – to select the first digit.	→	C – 1000
»		Press key >>. Second digit blinks.	→	C – 1000
+	-	Press key + or – to select the second digit.	→	C – 1900
»	»	Press key >> twice. Fourth digit blinks.	→	C – 1900
+	-	Press key + or – to select the fourth digit.	→	C – 1907
E		If the CODE number is correct, the first PARAMETER number at the selected level is displayed.	→	F – 100

4.3.1.1 Parameter Input at the Operator Level on the V810

Example: CODE number has not been inputted.

	TURN POWER ON	→	dA 321G
P	First parameter at the operator level is displayed.	→	F – 000
+	Second parameter at the operator level is displayed. The next or previous parameter can be called by pressing keys +/-.	→	F – 001
E	Parameter value is displayed.	→	003
+	Change parameter value by pressing keys +/-.	→	XXX
E	Parameter value is entered. Display advances to the next parameter.	→	F – 002
+	Press key + several times until the desired parameter is displayed.	→	F – 009
E	Parameter value is displayed.	→	0
+	New parameter value is displayed.	→	1

E	Next parameter is displayed.	➔	F – 013
or			
P	Exit programming.	➔	dA 321G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

Note! The parameter number can also be selected directly, like the code number!

4.3.1.2 Parameter Input at the Technician/Supplier Level on the V810

Example: After CODE number input at the technician level.

	After CODE number input, the first PARAMETER number is displayed.	➔	F – 100
+	Press key **+**. The next parameter number is displayed.	➔	F – 110
E	Press the **E** key. The parameter value is displayed.	➔	0180
+ -	Change the parameter value.	➔	0XXX
E	Parameter value is entered. Display advances to the next parameter.	➔	F – 111
or			
P	Parameter value is entered. The actual PARAMETER number is displayed.	➔	F - 110
or			
P P	Press the **P** key twice. Exit programming.	➔	dA 321G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

4.3.2 Code Number Input on the V820/V850

Technician Level Code Number => 1907 and Supplier Level Code Number => 3112

Example: Technician level CODE number selection on the V820 control panel

	TURN POWER OFF		
P +	TURN POWER ON	➔	C–0000
1 9 0 7	Input CODE number.	➔	C–1907
E	If CODE number is incorrect, repeat input.	➔	C–0000 InFo F1
E	If CODE number is correct, the first PARAMETER number at the selected level is displayed.	➔	F–100

4.3.2.1 Parameter Input at the Operator Level on the V820/V850

Example: CODE number has not been inputted.

		TURN POWER ON	→	4000 dA321G
P		Display shows no reading.	→	
E		First parameter at the operator level is displayed. PARAMETER number is not displayed.	→	c2 003
+	-	Change the parameter value.	→	c2 XXX
E		Parameter value is entered. Display advances to the next parameter.	→	c1 003
or				
P		Exit programming.	→	4000 dA321G

4.3.2.2 Parameter Input at the Technician/Supplier Level on the V820/V850

Example: After CODE number input at the technician level.

			After CODE number input, the first PARAMETER number is displayed.	→	F-100
E			The most significant digit of the PARAMETER number blinks.	→	F-100
1	1	0	Input desired PARAMETER Number.	→	F-110
E			If PARAMETER number is incorrect, repeat input.	→	F–XXX InFo F1
E			If PARAMETER number is correct	→	F–110 n1 180
+	-		Change the parameter value.	→	F-110 n1 XXX
E			Parameter value is entered. Display advances to the next parameter.	→	F-111 n2- 4000
or					
P			Parameter value is entered. A new PARAMETER number can be selected.	→	F-XXX
or					
P	P		Press the **P** key twice. Exit programming.	→	4000 dA321G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

4.4 Program Identification

Function **with** control panel	Parameter
Program number, modification index and identification number display	**179**

Display example parameter 179 on the V810 control panel:

- Select parameter 179.
- Press the **E** key ➔ **Sr5 [°]** is displayed
- Press the >> key ➔ e. g **5321H** is displayed (Program number with index)
- Press the **E** key ➔ e. g **010823** is displayed (1st part of date)
- Press the **E** key ➔ e. g **15** is displayed (2nd part of date)
- Press the **E** key ➔ e. g **1F68** is displayed (EPROM check sum)
- Press the **P** key twice ➔ **dA321G** is displayed (Sewing process can be started)

Display example parameter 179 on the V820/V850 control panel:

- Select parameter 179.
- Press the **E** key ➔ **F-179 Sr5 [°]** is displayed
- Press the >> key ➔ e. g. **PrG 5321H** is displayed (Program number with index)
- Press the **E** key ➔ e. g. **dAt 01082315** is displayed (Date)
- Press the **E** key ➔ e. g. **chk 1F68** is displayed (EPROM check sum)
- Press the **E** key ➔ e. g. **132650210015** is displayed (Serial number)
- Press the **E** key ➔ e. g. **Skn 01047543** is displayed (Control box number)
- Press the **P** key twice ➔ **4000 dA321G** is displayed (Sewing process can be started)

4.5 Direct Input of Maximum Speed Limitation (DED) with Control Panel

The maximum speed of the machine must be limited to the specific level according to the application. Do the setting at the operator level using keys +/- at any time. The actual value is shown on the display. The speed setting range is between parameter 111 (upper limit) and parameter 121 (lower limit).

4.5.1 Setting on the V810 Control Panel

	Type designation is displayed.	➔	**d A 3 2 1 G**
+	Maximum speed is displayed (reading remains on for max. 5 seconds)	➔	**4 0 0 0**
+ -	Change the value; e. g. press key – 8 times.	➔	**3 2 0 0**
	After approx. 5 seconds the display shows	➔	**d A 3 2 1 G**

4.5.2 Setting on the V820/V850 Control Panel

Actual display value, in the direct mode

	Maximum speed and type designation are displayed	➔	**4000 dA321G**
+ -	Change the maximum speed value; e. g. press key – 8 times !	➔	**3200 dA321G**

Note

Changing the setting of the maximum speed limitation also affects the start backtack, end backtack and stitch counting speeds.

4.6 Keys for Background Information (HIT) with V810/V820/V850

(key assignment see figure on the last page)

Note
The following functions are possible with the V820 and V850 control panels, to a limited extent with the V810.

For fast operator information, the values of functions switched on using key 1, 2, 3, 4 or 9 are displayed on the control panel for approx. 3 seconds. During this time, the respective values can be varied directly by pressing key + or -.

4.6.1 Example of HIT

Increase stitch-count seam section from 20 stitches to 25 stitches.
Stitch-count function (key 2) is off.

↓	Display after power on.	➔	4000 dA321G
2	Press key **2** briefly. Left-hand arrow and stitch-count function are on.	➔	Stc 020
+	Press key **+**. Increase the number of stitches from 20 to 25.	➔	Stc 025
	Display after approx. 3 seconds.	➔	4000 dA321G

Stitch-count function (key 2) is already on.

	Display after power on.	➔	4000 dA321G
↓ 2	Press key **2** for at least 1 second. Left-hand arrow goes off momentarily; stitch count function is on.	➔	Stc 020
+	Press key **+**. Increase the number of stitches from 20 to 25.	➔	Stc 025
	Display after approx. 3 seconds.	➔	4000 dA321G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

Function key F

Various parameters, even higher-level parameters, can be switched on or off by pressing the function key (key 9).
The following functions may be assigned to the function key:

1. Softstart ON/OFF
2. Ornamental backtack ON/OFF
3. Sewing start blocked with light barrier uncovered ON/OFF
4. Unlocking the chain ON/OFF
5. Signals A1 and/or A2 On/Off with slide-in strips 1...4 (left-hand arrow = A1, right-hand arrow = A2)
6. Signal A1 On/Off
7. Signal A2 On/Off

The key assignment can be changed as follows:

	Display after power on.	➔	4000 dA321G
P	Press the **P** key.	➔	
E	Press the **E** key.	➔	c2 002
E	Press the **E** key several times until the letter symbol –**F**– appears. (Ornamental backtack On/Off)	➔	-F- 2
-	Press key –. (Softstart On/Off)	➔	-F- 1
P	Press the **P** key.	➔	4000 dA321G
	The assignment is completed.		

The number of softstart stitches can be changed as follows:
Example: change number of stitches from 1 to 3 (softstart function (key 9) is off).

9	Press key **9** briefly. The arrow above the key lights up (softstart function is On).	➔	SSc 001
+	Press key +. Number of stitches increases.	➔	SSc 003
	Display after 3 seconds.	➔	4000 dA321G

Example: change number of stitches from 1 to 3 (softstart function (key 9) is already on).

9	Press key **9** for at least 1 sec. The arrow above the key goes off momentarily (softstart function is On).	➔	SSc 001
+	Press key +. Number of stitches increases.	➔	SSc 003
	Display after 3 seconds.	➔	4000 dA321G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

4.6.2 Further Functions Using V810/V820/V850

- Press the >> key ➔ The most significant digit blinks.
- Press the +/- key briefly ➔ The blinking digit changes by ±1.
- Keep the +/- pressed down ➔ The blinking digit keeps changing its value, as long as the key is pressed down.
- Press the >> key once more ➔ The next digit blinks.
- Press the +/- key as above!
- Press the **E** key ➔ The setting is completed.

With the code number and parameter number there is no carry over when changing from **0 to 9** or vice versa. Parameter values are, however, carried over. Therefore, you can use keys +/- to change the value between the minimum and maximum value.
If the value change is significant, it is better to use key >>. If the value change is insignificant, use keys +/-.
For setting the minimum or maximum value, select the most significant digit using key >>. Then keep pressing key – for the minimum or key + for the maximum value.

In addition to the above description the values can also be inputted directly using keys **0...9** on the V820/V850.

4.6.3 Special Functions Using V820/V850

The example below shows how minimum or maximum values can be set quickly.

2 **0** **0**	Select parameter 200	➔ **F-200**
E	Press the **E** key. The set value is displayed.	➔ **F–200 t1 050**
0 **0** **0**	Press key **0** three times. The minimum value is displayed.	➔ **F-200 t1 000**
9 **9** **9**	Press key **9** three times. The maximum value is displayed.	➔ **F-200 t1 500**

4.6.4 Keylock Programming

Function **with** or **without** control panel		Parameter
Disabling the **P** and **E** keys on the control panels and the **P** key on the control	(EPE)	**326**
Disabling the **+** and **–** keys on the control panels	(EPm)	**327**
Disabling the **E, +, -** and **>>** keys on the control	(ob)	**328**

The **P** and **E** keys on the control panels can be enabled or disabled using **parameter 326**. On the control, only the **P** key can be disabled using this parameter.

326 = 0 Keys P and E are Off
326 = 1 Key P is On and key E is Off
326 = 2 Key P is Off and key E is On
326 = 3 Keys P and E are On

The + and – keys as well as the functions "direct input of maximum speed limitation" and "background information keys" can be enabled or disabled on the control panels and the function "direct input of maximum speed limitation" on the control using **parameter 327**.

327 = 0 Keys + and – are disabled (on the control, only the function "direct input of maximum speed limitation" disabled).
327 = 1 Keys + and – are enabled

The **E**, **+**, **-** and >> keys on the control can be disabled using **parameter 328**.

328 = 0 Keys **E**, **+**, **-** and >> are disabled
328 = 1 Keys **E**, **+**, **-** and >> are enabled

Keys **1...4** on the V810 and **1...0** on the V820/V850 can be disabled using one of the following parameters.

291 = 0 Keys **1...4** on control panel V810 are disabled.
292 = 0 Keys **1...0** on control panel V820/V850 are disabled.

Keys **F1** and **F2** can be disabled using one of the following parameters.

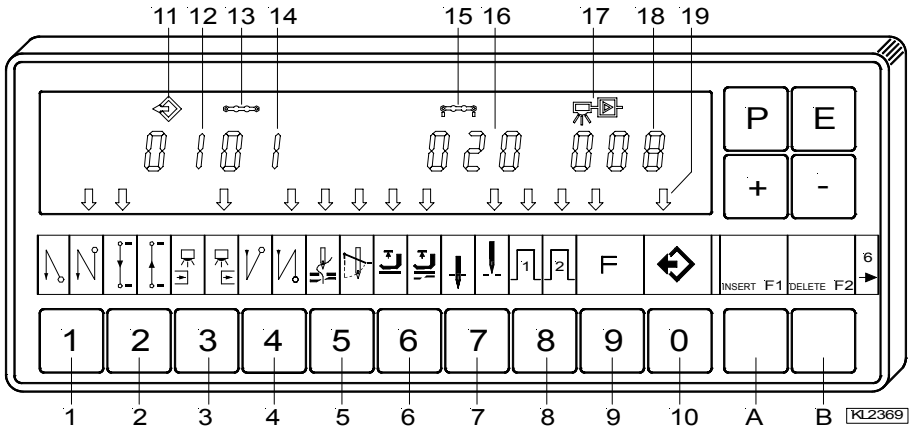
293 = 0 Key **F1** on the V810/V820 control panels is disabled.
294 = 0 Key **F2** on the V810/V820 control panels is disabled.

Note
Key disabling can be undone after power On upon inputting the code number!

4.7 Programming of Seams (TEACH IN)

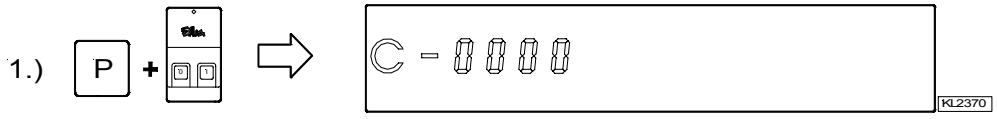
- A maximum of 99 patterns with a total of 99 seams can be programmed, i. e. 1 pattern with 99 seams each or 99 patterns with 1 seam each. In between, all combinations are possible.
- Programming is possible with or without code number.
- The functions “start backtack”, “end backtack”, “stitch counting”, “light barrier”, “thread trimmer”, “sewing foot lift” and “needle positions” can be assigned individually to each seam.
- The functions of signals A1 and A2 can also be assigned to each seam, on condition that slide-in strip 6, 8, 9, 10 has been inserted into the V820 control panel and activated using the respective parameter 292.
- The stitches for start and end backtack and stitch counting as well as the compensating stitches for the light barrier function can be programmed individually for each seam section.
- Several counted seam sections can be linked (key 9).

Attention! The “TEACH IN“ function has been changed as compared to the 62 and 82 type series!
Seams and/or patterns can be added by pressing the **INSERT F1** key or erased by pressing the **DELETE F2** key. Before programming new patterns and/or seams it is advisable to erase previously saved patterns and/or seams by pressing the **DELETE F2** key according to chapter “Deleting a Seam or Pattern“. If patterns or seams are to be inserted between existing ones, press the **INSERT F1** key according to chapter “Inserting a Seam or Pattern“.
Example: 3 patterns are in the memory. Delete the 2nd pattern by pressing the **DELETE F2** key. The 3rd pattern takes the place of the 2nd pattern. A new 2nd pattern can be installed by pressing the **INSERT F1** key. The pattern in 2nd place will go back to being pattern no. 3.
If patterns and/or seams are only to be added, proceed as described in the following chapters.

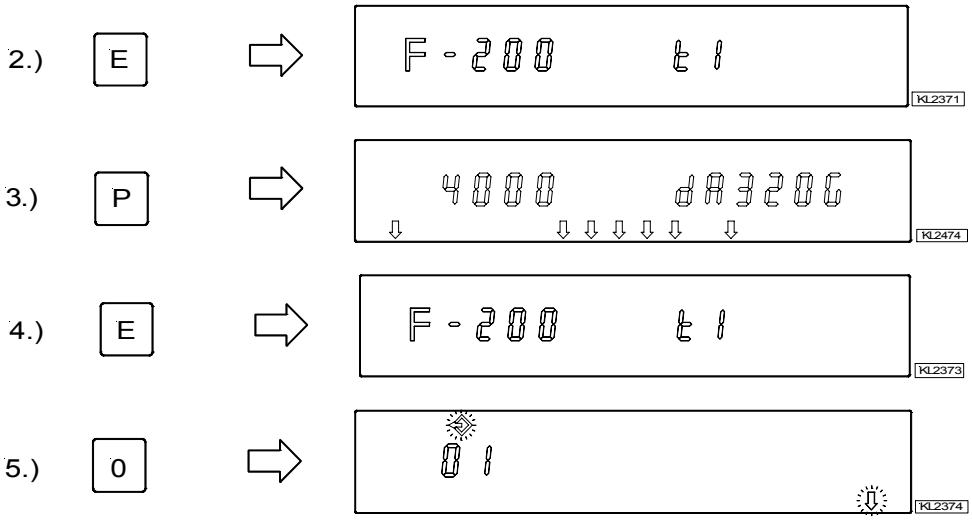


1 = Single start backtack On (left-hand arrow)
Double start backtack On (right-hand arrow)
Start backtack Off
2 = Counted seam forward On (left-hand arrow)
Counted seam backward On (right-hand arrow)
Counted seam Off
3 = Light barrier uncovered/covered On (left-hand arrow)
Light barrier covered/uncovered On (right-hand arrow)
Light barrier Off
4 = Single end backtack On (left-hand arrow)
Double end backtack On (right-hand arrow)
End backtack Off
5 = Thread trimmer On (left-hand arrow)
Thread wiper On (right-hand arrow)
Thread trimmer and thread wiper On (both arrows)
Thread trimmer and thread wiper Off
6 = Sewing foot in the seam On (left-hand arrow)
Sewing foot after seam end On (right-hand arrow)
Sewing foot in the seam and after seam end On (both arrows)
Sewing foot Off
7 = Basic position down (left-hand arrow)
Basic position up (right-hand arrow)
8 = Signal A1 On (left-hand arrow)
Signal A2 On (right-hand arrow)
Signal A1 and A2 On (both arrows)
Signal A1 and A2 Off
9 = Switching from one seam to the next On (left-hand arrow)
Switching from one seam to the next Off
10 = Programmed seams TEACH IN On (left-hand arrow)
Programmed seams TEACH IN Off
11 = Program symbol
12 = Display of program number
13 = Seam symbol
14 = Display of seam number
15 = Symbol for number of stitches of a seam
16 = Display of number of stitches
17 = Light barrier symbol
18 = Display of light barrier compensating stitches
19 = Arrow for TEACH IN
A = INSERT ➔ Insert seams or patterns
B = DELETE ➔ Delete seams or patterns

4.7.1 Programming after Code Number Input

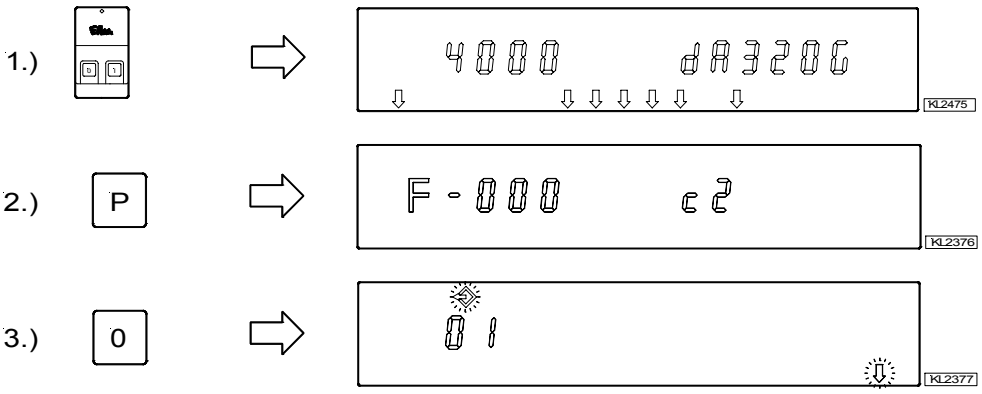


- Input code number using keys 0...9.

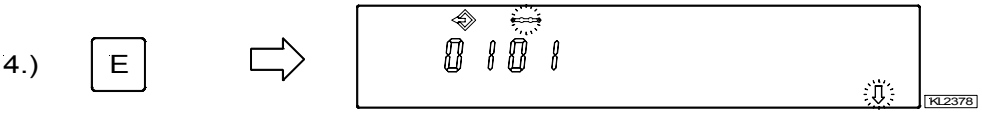


Activate programming of seams TEACH IN using key 0 / Display of pattern number.
New pattern numbers are determined using keys 0...9. The next available program number is selected using key +.
Continue the programming of seams as described in the next chapter "Programming without Code Number Input" from item 4.) onwards.

4.7.2 Programming without Code Number Input

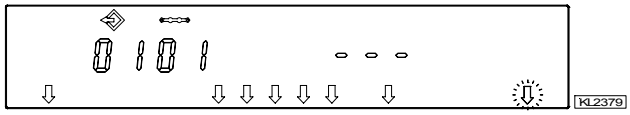


- Activate programming of seams TEACH IN using key 0 / Display of pattern number. New pattern numbers are determined using keys 0...9. The next available program number is selected using key +.

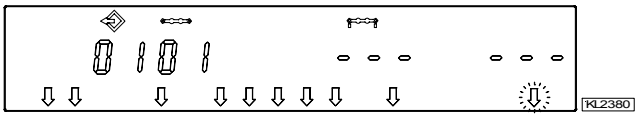


- Display of seam number

5.) E

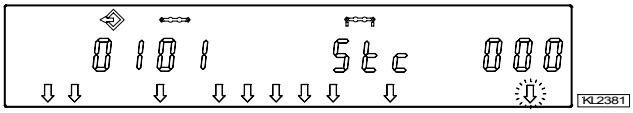


6.) 1 ... 9



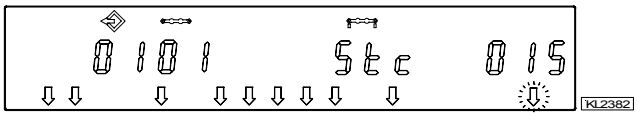
- Enable all desired functions of the actual seam. as for ex. light barrier, by pressing keys **1...9**.

7.) 2



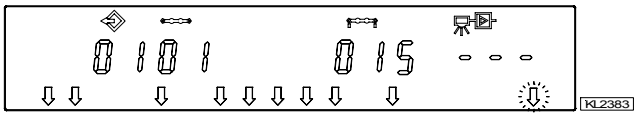
- After having enabled stitch counting using key **2**, the number of stitches can be varied within 2 seconds. If stitch counting has already been selected, press key **2** for approx. 2 seconds in order to vary the number of stitches. The arrow above key **2** switches briefly.

8.) + -



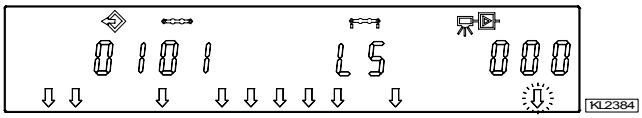
- Press key +/- immediately.

9.)



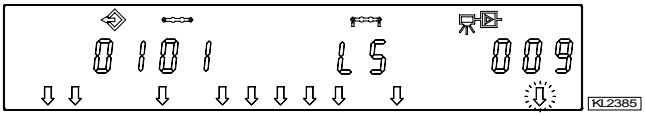
- If key +/- has not been pressed within 2 seconds, the previously input number of stitches will be displayed under the corresponding symbol (normal display).

10.) 3



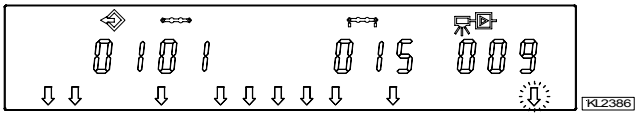
After having enabled the light barrier using key **3**, the number of light barrier compensating stitches can be varied within 2 seconds. If the light barrier has already been selected, press key **3** for approx. 2 seconds in order to vary the number of light barrier compensating stitches. The arrow above key **3** switches briefly.

11.) + -



- Press key +/- immediately.

12.)



- If key +/- has not been pressed within 2 seconds, the previously input number of stitches will be displayed under the corresponding symbol (normal display).
- Change to the next seam by pressing the **E** key once.
- Exit programming of seams by pressing the **P** key twice.
- **Start sewing** in order to save the values.

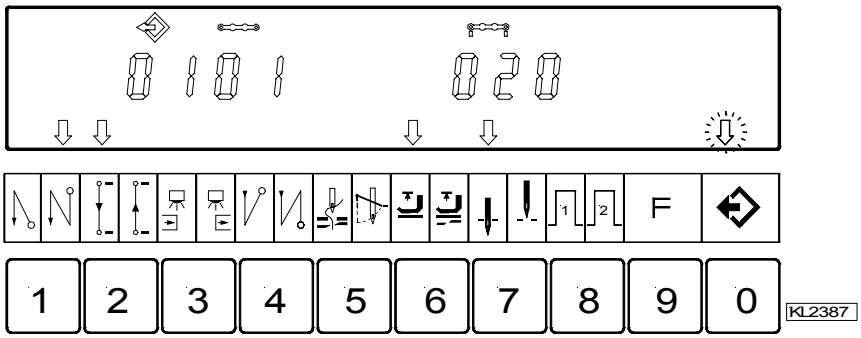
4.7.3 Detailed Example

A seam 01 with double start backtack, stitch counting forward, position down, sewing foot up, a seam 02 with stitch counting forward, position down and a seam 03 with light barrier, double end backtack, thread trimming, position up, sewing foot up, are to be programmed (without code number input) under the next possible pattern number, e.g. 01.

- Turn power on
- Press key **P** ➔ Parameter 000 is displayed.
- Press key **0** ➔ Pattern number is displayed. The pattern symbol and the left-hand arrow above key 0 blink.
- Press key **F2** ➔ Existing patterns will be deleted. If there is a 2nd pattern or more patterns, pattern number 01 must be inserted by pressing the INSERT F1 key.

Set functions of seam 01:

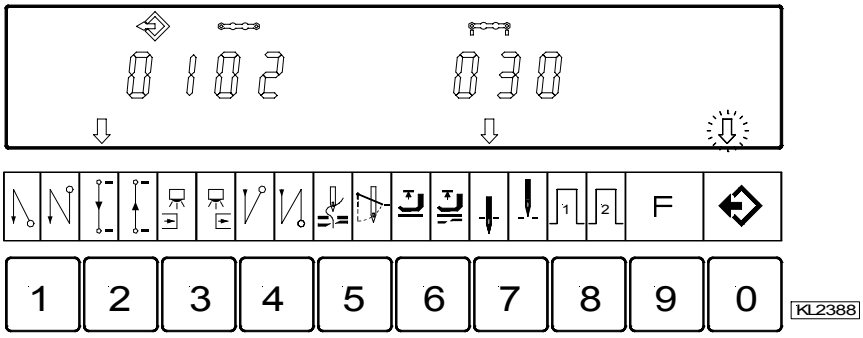
- Press key **E** ➔ Seam number **01** is displayed.
- Press key **E** ➔ Functions can be programmed.
- Press key **1** ➔ The right-hand arrow above key 1 indicates that the double start backtack is On. The start backtack stitches must be input individually.
- Press key **2** ➔ The left-hand arrow above key 2 indicates that stitch counting forward is On. The number of stitches can be varied as previously shown.
- Press key **6** ➔ The left-hand arrow above key 6 indicates that the sewing foot is automatically lifted in the seam.
- Press key **7** ➔ The left-hand arrow above key 7 indicates that the needle is in the down position.



Display of seam **01** after correct function input

Set functions of seam 02:

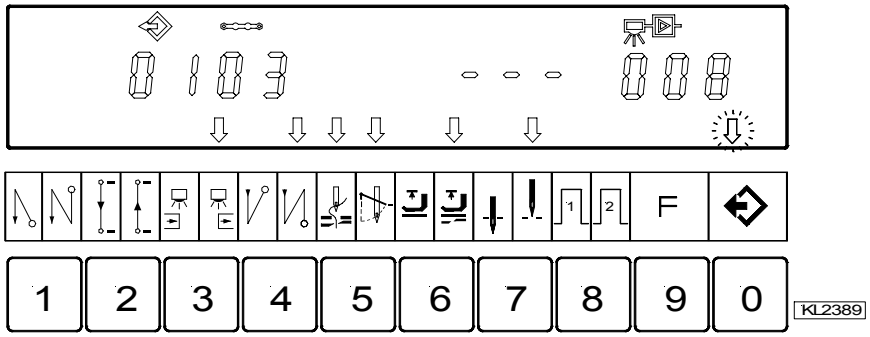
- Press key **E** ➔ Seam number **02** is displayed.
- Press key **2** ➔ The left-hand arrow above key 2 indicates that stitch counting forward is On. The number of stitches can be varied as previously shown.
- Press key **7** ➔ The left-hand arrow above key 7 indicates that the needle is in the down position.



Display of seam **02** after correct function input

Set functions of seam 03:

- Press key **E** ➔ Seam number **03** is displayed.
- Press key **3** ➔ The right-hand arrow above key 3 indicates that the light barrier operates covered ➔ uncovered. The light barrier compensating stitches can be varied as previously shown.
- Press key **4** ➔ The right-hand arrow above key 4 indicates that the double end backtack is On. The end backtack stitches must be input individually.
- Press key **5** ➔ Both arrows above key 5 indicate that thread trimmer and thread wiper are On.
- Press key **6** ➔ The left-hand arrow above key 6 indicates that the sewing foot is automatically lifted in the seam.
- Press key **7** ➔ The lefthand arrow above key 7indicates that the needle is in the up position.



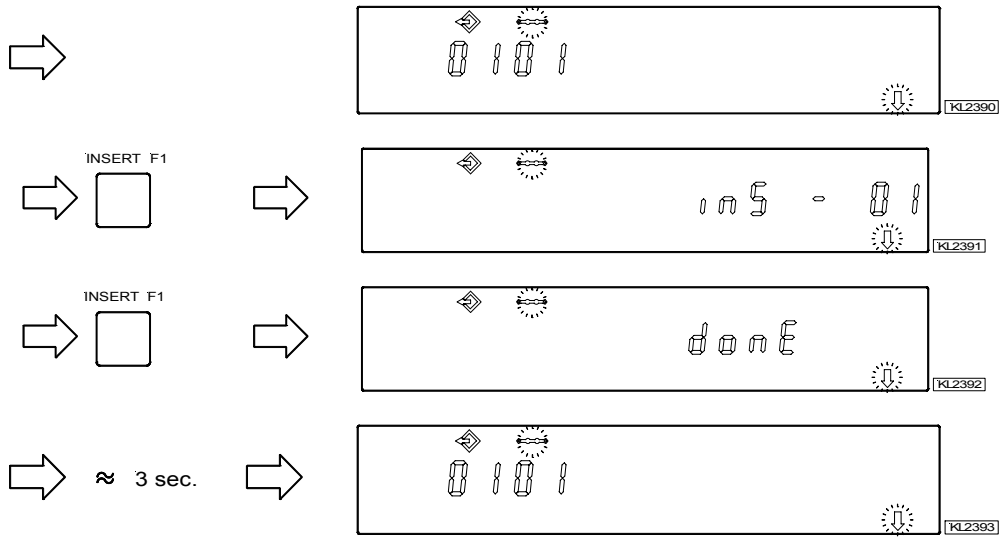
Display of seam **03** after correct function input

- Press the **P** key twice ➔ Exit programming of seams.
- Start sewing once ➔ The programmed data are saved.

4.7.4 Inserting a Seam or Pattern

A pattern or seam can be inserted using the **A "INSERT F1"** key, on condition that the symbol above the pattern or seam number is blinking during programming.

- Select the pattern or seam number where the new number is to be inserted. The symbol above the pattern or seam number must be blinking. Proceed as shown in chapters **"Programming with or without Code Number Input"**.
- Press the A **"INSERT F1"** key twice in brief succession. The new pattern or seam number will be inserted. All subsequent numbers are automatically augmented by "1". The following example shows how a seam is inserted before the existing seam.

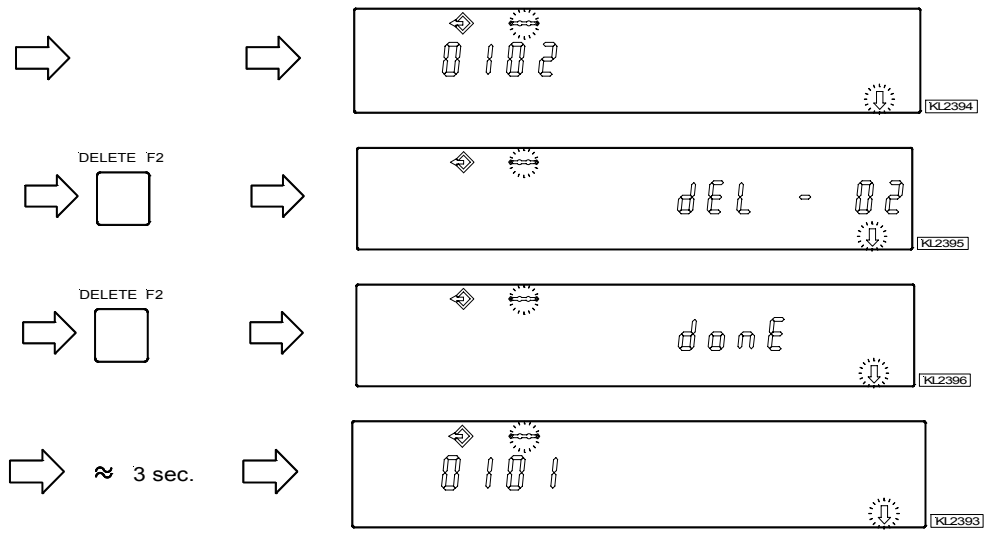


- Any desired function can now be assigned to the new seam.

4.7.5 Deleting a Seam or Pattern

A pattern or seam can be deleted using the **B "DELETE F2"** key, on condition that the symbol above the pattern or seam number is blinking during programming.

- Select the pattern or seam number to be deleted. The symbol above the pattern or seam number must be blinking. Proceed as shown in chapters **"Programming with or without Code Number Input"**.
- Press the B **"DELETE F2"** key twice in brief succession. The pattern or seam number will be deleted. All subsequent numbers are automatically reduced by "1". The following example shows how seam number 2 is deleted.



4.7.6 Execution (Pattern) Mode

- Press key **0** ➔ The programmed seams are enabled. Arrow above key 0 is On (but it does not blink).
- Press key +/- ➔ Selection of pattern. Only if several patterns have been programmed.
- Press key **E** ➔ If you do not wish to start with the first seam, select a different seam number. Press the E key several times until the desired seam number is displayed.
- The drive can now be started by pressing the pedal, and the pattern can be executed.
- Press key **0** ➔ The programmed seams are disabled. Arrow above key 0 is Off.

4.7.7 Further Settings for TEACH IN

Functions		Parameter
Seam suppression if 0 stitches are set	(Std)	**321**

321 = 0 **Seam suppression disabled:** i. e. if the light barrier is Off and stitch counting is set at 0 stitches, a free seam will be performed.

321 = 1 **Seam suppression enabled:** i. e. if the light barrier is Off and stitch counting is set at 0 stitches, the program switches to the next seam if the function is On. In case functions such as start of end backtack, thread trimmer, signals A1 / A2 are On, they will be performed before switching to the next seam.

Functions		Parameter
Correction seam On/Off, seam or pattern interruption by thread trimmer	(dkn)	**322**

322 = 0 **Correction seam disabled:**
- The seam can be interrupted by pressing the pedal to pos. –2. The control switches automatically to the next seam number.

322 = 1 **Correction seam enabled:**
- The seam can be interrupted by pressing the pedal to pos. –2 and thread trimming, and a correction seam (free seam) can be performed manually.
- The correction seam can be completed by pressing the pedal to pos. –2 or by light barrier if it is On. Then the control switches automatically to the next seam number.

322 = 2 **Seam or pattern interruption by thread trimming**
- The seam can be interrupted by pressing the pedal to pos. –2 and thread trimming, even if the thread trimmer is Off. Then the program switches back to the **first** seam of the selected pattern.

Sewing foot lift functions if TEACH IN is On:

After power on the sewing foot is down even if sewing foot lifting after thread trimming is On on the control panel. the sewing foot can be lifted by pressing the pedal to pos. –1 or –2.
If sewing foot lifting is On at the seam end (right-hand arrow above key 6 on the V820/V850 control panel On), the sewing foot is lifted after completing the seam. After having pressed the pedal to pos. 0 (neutral) the control switches to the next seam, and the sewing foot remains lifted until sewing is started. Whether or not the sewing foot is On or Off does not influence the seam end in the new seam.

Automatic sewing foot lift with pedal forward at the seam end, if light barrier or stitch counting is On:

023 = 0 Automatic sewing foot lift Off
023 = 1 Automatic sewing foot lift On

This function is active only if TEACH IN is On.

323 = 0 After power On, the sewing foot lift function works as programmed.
323 = 1 The sewing foot is always lifted after power On, even if automatic sewing foot lift is not programmed.

Functions		Parameter
TEACH IN On/Off	(ti)	**324**

Using this parameter, TEACH IN can be enabled and disabled without control panel. However, TEACH IN programming is possible only with the V820/V850 control panel.
When a V820/V850 is connected, TEACH IN is enabled or disabled using key 0.

Functions		Parameter
Erasing all **TEACH IN** data	(cti)	**325**

- Input code number 3112 after power On → Press the **E** key
- Input parameter 325 → Press the **E** key
- Input 3112 → Press the **P** key
- The display briefly shows "**deleted**", and a short acoustic signal is issued. → Press the **P** key
- All TEACH IN programs have been erased! → Press the **P** key
- The sewing process is enabled again.
- If you press key **0** now, the display shows "**no ProG"**

4.7.8 Keylock on the V820/V850 with Activated TEACH IN

292 = 0 Keys **1...0** are disabled.
293 = 0 Key **F1** is disabled.
294 = 0 Key **F2** is disabled.
326 = 0 Keys **P** and **E** are Off (no programming, no switching from one seam to the next).
326 = 1 Key **P** is On and key **E** is Off (programming enabled; switching from one seam to the next disabled using key **E**).
326 = 2 Key **P** is Off and key **E** is On (programming disabled; switching from one seam to the next enabled using key **E**).
326 = 3 Keys **P** and **E** are On.

Disable switching from one pattern to the next at the seam start using keys + and –.
327 = 0 Keys + and – are disabled (switching from one pattern to the next impossible).
327 = 1 Keys + and – are enabled.

5 Putting into Service

Before putting the control into service, the following must be ensured, checked and/or adjusted:

- The correct installation of the drive, position transmitter and accompanying devices, if necessary
- If necessary, the correct adjustment of the direction of motor rotation using parameter 161
- The correct positioning speed using parameter 110
- The correct maximum speed compatible with the sewing machine using parameter 111
- The setting of the positions
- The setting of the remaining relevant parameters
- Start sewing in order to save the set values

6 Setting and Putting into Service with the Aid of the Fast Installation Routine (SIR)

The Fast Installation Routine (SIR) passes through all parameters necessary for programming the functional sequence and the positions.

Input parameter 500 (call-up SIR)

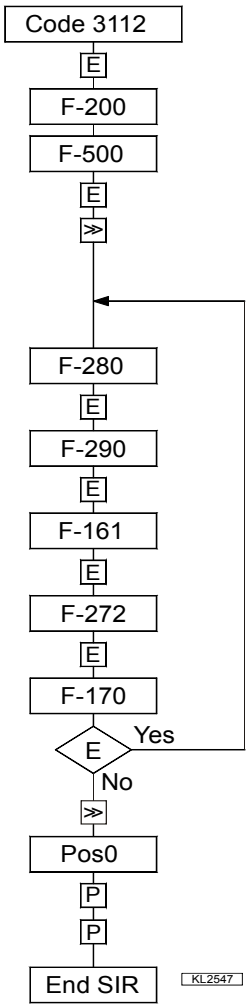
Display of select resistance

Input machine model for the identified select resistance

Parameter for direction of motor rotation

Parameter for transmission ratio
(**Important!** The transmission ratio should be determined and indicated as precisely as possible.)

Set the reference position



The values can be varied by pressing the +/- keys. When the parameter is displayed on the V810 control panel, press the E key once more for the value to be displayed.

Functions		Parameter
Call-up of the Fast Installation Routine SIR	(Sir)	**500**

Setting on the V810 control panel:

- Input code number **3112.**
- Press the **E** key ➔ The lowest parameter **2.0.0.** appears at this level
- Select **500** ➔ Parameter **5.0.0.** is displayed
- Press the **E** key ➔ Character **[o]** appears blinking
- Press the >> key ➔ Parameter **280** appears
- Press the **E** key ➔ Parameter value of the identified select resistor, for ex. 1000, is displayed
- Press the **+/-** key ➔ +/- keys are now disabled; parameter value cannot be changed
- Press the **E** key ➔ Parameter **290** appears
- Press the **E** key ➔ Parameter value **00** appears
- Press the +/- key ➔ Parameter value (machine model (mode) for the identified select resistor) can be set
- Press the **E** key ➔ Parameter **161.** appears
- Press the **E** key ➔ Parameter value **1** appears
- Press the +/- key ➔ Parameter value (direction of motor rotation) can be set
- Press the **E** key ➔ Parameter **272.** appears
- Press the **E** key ➔ Parameter value **1000** appears
- Press the +/- key ➔ Parameter value (transmission ratio) can be set
- Press the **E** key ➔ Parameter **170** appears (setting the reference position)
- Press the **E** key ➔ Character **[o]** appears blinking
- Upon pressing the **E** key once more the program returns to parameter 290
- Press the >> key ➔ POS 0 (setting the reference position)
- Press the **P** key twice ➔ Exit SIR routine

Setting on the V820/V850 control panel:

- Input code number **3112.**
- Press the **E** key ➔ The lowest parameter **2.0.0.** appears at this level
- Select **500** ➔ Parameter **5.0.0.** is displayed
- Press the **E** key ➔ Character **[o]** appears blinking
- Press the >> key ➔ Parameter **280 SEL 1000.** appears (display of the select resistor, for ex. 1000)
- Press the **+/-** key ➔ +/- keys are now disabled; parameter value cannot be changed
- Press the **E** key ➔ Parameter **290 mkl 00** appears (machine model (mode) for the identified select resistor)
- Press the +/- key ➔ Parameter value for mode can be set
- Press the **E** key ➔ Parameter **161 drE 1.** appears (direction of motor rotation)
- Press the +/- key ➔ Parameter value for direction of rotation can be set
- Press the **E** key ➔ Parameter **272 trr 100.** appears (transmission ratio)
- Press the +/- key ➔ Parameter value for transmission ratio can be set
- Press the **E** key ➔ Parameter **170 SR1** appears (setting the reference position); character **[o]** appears blinking
- Upon pressing the **E** key once more the program returns to parameter 290
- Press the >> key ➔ POS 0 (setting the reference position)
- Press the **P** key twice ➔ Exit SIR routine

7 Setting the Basic Functions

7.1 Direction of Motor Rotation

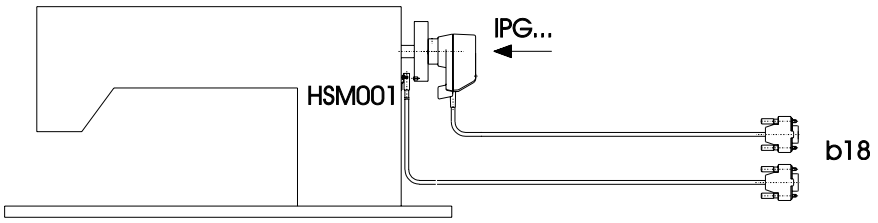
Function **with** or **without** control panel		Parameter
Direction of motor rotation	(drE)	**161**

Parameter 161 = 0 Clockwise motor rotation (look at the motor shaft)
Parameter 161 = 1 Counterclockwise motor rotation

ATTENTION
If the motor is mounted differently, e. g. at a different angle or with gear, make sure that the value set using parameter 161 corresponds to the direction of rotation.

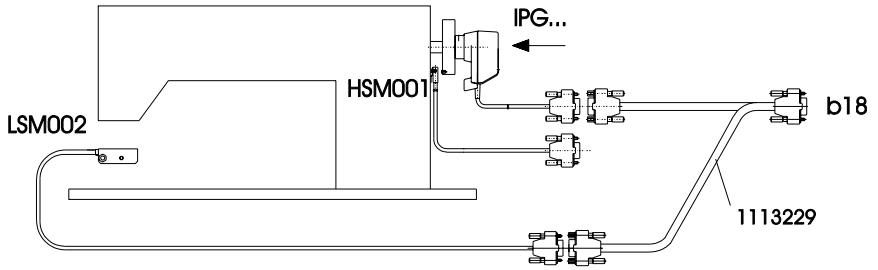
7.2 Use of a HSM001 Hall Sensor Module or IPG... Pulse Encoder

Representation and installation of a HSM001 Hall sensor module or IPG... pulse encoder



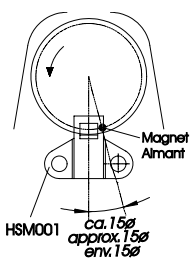
KL2521

Representation and installation of a HSM001 Hall sensor module or IPG... pulse encoder together with a LSM002 light barrier module using adapter cord no. 1113229



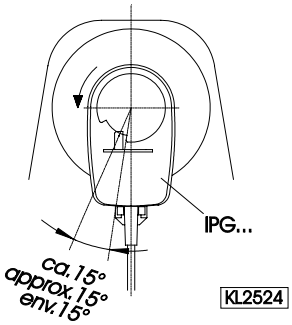
KL2522

Operation with HSM001 Hall sensor module **Operation with IPG... pulse encoder**



KL2523

- Get machine to the needle-up position.
- Position bore for magnet such that the magnet is located approx. 15° after the sensor in the sense of rotation.
- Get machine to the needle-up position.
- Turn disk in the pulse encoder such that the leading edge will be located approx. 15° after the sensor on the board.



KL2524

7.3 Selection of the Machine Series

Function **with** or **without** control panel		Parameter
Display of the machine series	(SEL)	**280**

The various machine models are specified by resistors. The following resistance values (tolerance ± 1%) are provided:

Select resistor	Machine model
100Ω	271*, 272*, 273*, 274*, 275*
220Ω	205*
680Ω	069*, 267*, 268*, 269*, **4180, 4280**
1000Ω	367*, 381*, 382*, 467*, 767*, 768*, **867**
*) The parameter values for these machine models are prepared. Before putting into service make sure to check whether the settings are suitable for the machine used.	

Select resistor is connected:
The special functional sequences for this machine type and the various preset values are activated depending on the resistor identified. If such a select resistor is connected, it can be read out using parameter 280. The resistance value is displayed in Ohm directly on the control panel. The value cannot be varied.

Select resistor is not connected:
If no select resistor is connected, Info **A5** (emergency run) is displayed. After power On and inputting the code number, a supposed select resistor value can be inputted using parameter 280. After that, the input must be saved using parameter 401 = 1. Then press the P key twice, and Info **A4** will be displayed. After turning the power on and off again, the preset values are set depending on the select for the respective machine model.

7.3.1 Emergency Run Function If Machine Select Is Invalid

If the control cannot identify an admissible value for the machine select resistor, only emergency run functions are possible. All parameter settings and preset values are preserved.

Display:

	V810	V820/V850
Emergency run function due to invalid machine select ➔	InF A5	InF A5

Available emergency run functions

- Speed is limited to 1000 RPM
- Machine run blockage (safety switch)
- Sewing foot lift when heeling the pedal back (-1, -2)

7.3.2 Machine Model Selection Using Parameter 290

This drive is suitable for different sewing machine models.
The mode for the functional sequence required on the respective machine can be selected using parameter 290.
The preset values for different machines depend on the respective select resistor and vary according to the selected mode.
Find a corresponding table in the List of Parameters.

If parameter 290 = 0, the maximum speed is limited to 1000 RPM, and the thread trimmer is Off.

7.4 Transmission Ratio

Note
The transmission ratio must always be inputted because only motors with integrated incremental transmitter will be used. **The transmission ratio should be determined and set as precisely as possible!**

The transmission ratio between motor shaft and shaft of the sewing machine head must be input, so that the set speeds of parameters 110...117 correspond to the sewing speeds.

Function **with** or **without** control panel		Parameter
Transmission ratio between motor shaft and machine shaft	(trr)	**272**

The transmission ratio can be selected within a range of 150...40000 using parameter 272.

Example: With a motor pulley diameter of 40mm and a sewing machine head pulley diameter of 80mm the value 500 can be calculated using the formula below. If the value 2000 has been selected in parameter 272, it follows that the motor pulley is double the size of the sewing machine head pulley.

$$\text{Value of parameter 272} = \frac{\text{Motor pulley diameter}}{\text{Machine pulley diameter}} \times 1000$$

7.5 Positioning Speed

Function **with** or **without** control panel		Parameter
Positioning speed	(n1)	**110**

The positioning speed can be set using parameter 110 on the control within a range of 70...390 RPM.

7.6 Maximum Speed Compatible with the Sewing Machine

The maximum speed of the machine is determined by the selected pulley and by the following settings:

- Set the maximum speed using parameter 111 (n2)
- Set the maximum speed limitation to the specific level according to the application as described in chapter "Direct Input of Maximum Speed Limitation (DED)".

7.7 Maximum Speed

Function **with** or **without** control panel		Parameter
Maximum speed	(n2)	**111**

Note
See instruction manual of the sewing machine manufacturer for the maximum speed of the sewing machine.

Note
Select the pulley such that the motor runs at approx. 4000 RPM with max. number of stitches.

When programming 3-digit or 4-digit parameter values on the control (without control panel), the 2-digit or 3-digit values displayed must be multiplied by 10.

7.8 Positions

Function **with** or **without** control panel		Parameter
Setting the reference position	(Sr1)	**170**
Setting the needle positions	(Sr2)	**171**
Selection according to position sensor	(PGm)	**270**
Transmission ratio between motor shaft and machine shaft	(trr)	**272**

After setting parameter 270 at "1, 2, 3 or 4" an angular degree must be selected using parameter 171, which determines the stop in position 2 or 1 after the sensor position. The transmission ratio must already have been input using parameter 272. If 270 = 6, only the reference position must be set. The angular values are preset according to the mode selected using parameter 290.

Connection of a sensor e. g. light barrier to socket B18/7.

The following settings are possible using **parameter 270**:

270 = 0 - The positions can be generated with the help of the transmitter incorporated in the motor and can be set using parameter 171.

270 = 1
- Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 171.
- Start measuring from leading edge position 2.
- 0V at input B18/7 (inside of the window)
- +5V at input B18/7 (outside of the window)

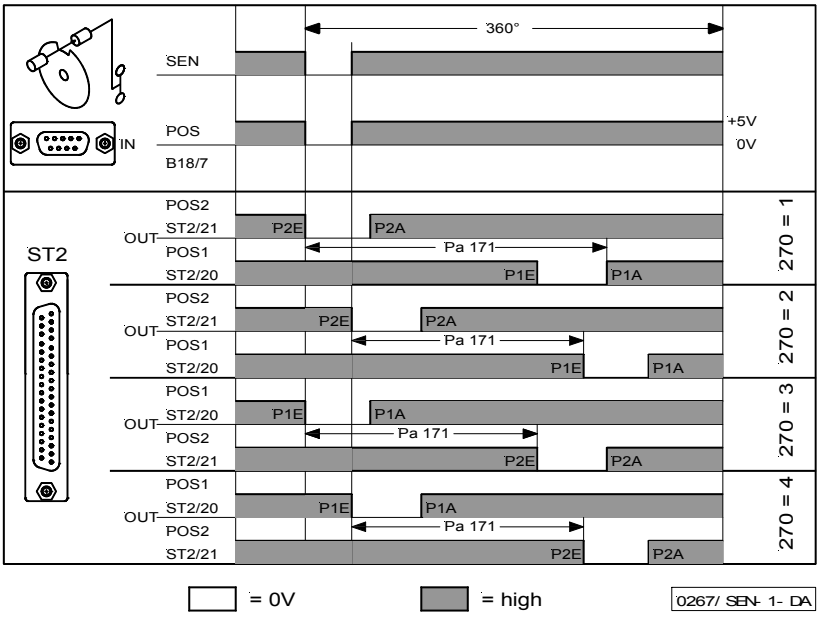
270 = 2
- Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 171.
- Start measuring from trailing edge position 2.
- Input and output level as with setting "1"

270 = 3
- Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 171.
- Start measuring from leading edge position 1.
- Input and output level as with setting "1"

270 = 4
- Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 171.
- Start measuring from trailing edge position 1.
- Input and output level as with setting "1"

270 = 5 - There is no position sensor. The drive stops unpositioned. The thread trimmer is suppressed.

270 = 6 - The positions are determined by preset values. The reference position must be correctly set for this purpose. In machines with position sensors incorporated in the handwheel the reference position is determined by mechanical adjustment. In all other cases the reference position must be set (see chapter "Setting the Reference Position") in order for the angles preset by machine select for positions 1 and 2 to be correct. If necessary, the preset values can be adapted as described in chapters "Setting the Positions".



OUT (position window) = npn transistor (emitter to 0V) is conductive. The width of position window cannot be adjusted.

Connection of a sensor e. g. light barrier or proximity switch to socket B18/7.

The following settings are possible using **parameter 270**:

270 = 1
- Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 171.
- Start measuring from trailing edge position 2.
- 0V at input B18/7 (inside of the window)
- +5V at input B18/7 (outside of the window)

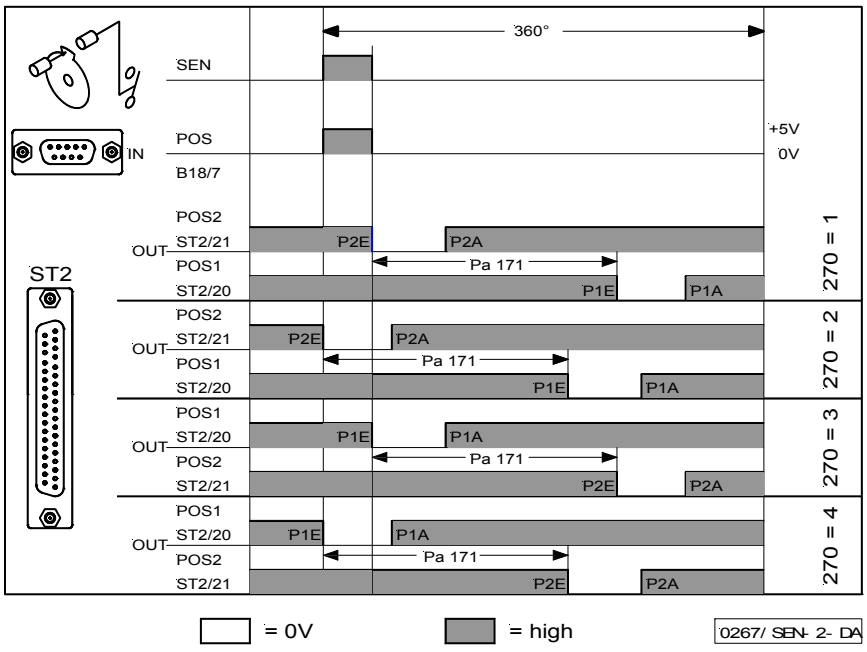
270 = 2
- Setting the sensor to position 2.
- Position 1 is set according to the angular degree setting using parameter 171.
- Start measuring from leading edge position 2.
- Input and output level as with setting “1“

270 = 3
- Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 171.
- Start measuring from trailing edge position 1.
- Input and output level as with setting “1“

270 = 4
- Setting the sensor to position 1.
- Position 2 is set according to the angular degree setting using parameter 171.
- Start measuring from leading edge position 1.
- Input and output level as with setting “1“

270 = 5
- There is no position sensor. The drive stops unpositioned. The thread trimmer is suppressed.

270 = 6
- The positions are determined by preset values. The reference position must be correctly set for this purpose. In machines with position sensors incorporated in the handwheel the reference position is determined by mechanical adjustment. In all other cases the reference position must be set (see chapter “Setting the Reference Position”) in order for the angles preset by machine select for positions 1 and 2 to be correct. If necessary, the preset values can be adapted as described in chapters “Setting the Positions”.



OUT (position window) = npn transistor (emitter to 0V) is conductive. The width of position window cannot be adjusted.

7.8.1 Setting the Reference Position (Parameter 270 = 0)

The angular positions necessary on the machine e.g. “needle down position“ or “thread lever up position“ are stored in the control. A reference position is needed in order to establish a relationship between position transmitter information and actual mechanical position. The reference position may vary according to the parameter setting; normally it is the “needle penetration point in needle plate” (see parameter 290).

The reference position must be set:

- for initial operation
- after replacing the motor
- after replacing the microprocessor

Setting the reference position on the control

- Input code number and select parameter 170.
- Press the **E** key ➔ Display **Sr1**
- Press the >> key ➔ Display **P o** (character o rotating)
  Turn handwheel until rotating ➔ Display **P**
  character **o** goes off on the display.
- Then set the handwheel to the reference position
- Press the **P** key once ➔ Actual parameter number is displayed
- Press the **P** key twice ➔ Exit programming at the technician level

Setting the reference position on the V810 control panel

- Input code number and select parameter 170.
- Press the **E** key ➔ Display **Sr1 [o]**
- Press the >> key ➔ Display **PoS0 o** (character o rotating)
  Turn handwheel until rotating ➔ Display **PoS0**
  character **o** goes off on the display.
- Then set the handwheel to the reference position
- Press the **P** key once ➔ Actual parameter number is displayed
- Press the **P** key twice ➔ Exit programming at the technician level

Setting the reference position on the V820 control panel

- Input code number and select parameter 170.
- Press the **E** key ➔ Display **F-170 Sr1 [o]**
- Press the **F2** key ➔ Display **PoS0 o** (character o rotating)
  Turn handwheel until rotating ➔ Display **PoS0**
  character **o** goes off on the display.
- Then set the handwheel to the reference position.
- Press the **P** key once ➔ Actual parameter number is displayed
- Press the **P** key twice ➔ Exit programming at the technician level

If error message A3 (reference position not set) appears, repeat the above setting sequence!

7.8.2 Setting the Positions on the Control (Parameter 270 = 0)

If no reference position has been set, or settings are to be changed, proceed as follows:

- Input code number and select parameter 171.
- Press the **E** key ➔ **[Sr2_]** is displayed
- Press the >> key ➔ **P1E** is displayed; set "position 1 On" by turning the handwheel*
- Press the **E** key ➔ **P2E** is displayed; set "position 2 On" by turning the handwheel*
- Press the **E** key ➔ **P1A** is displayed; set "position 1 Off" by turning the handwheel*
- Press the **E** key ➔ **P2A** is displayed; set "position 2 Off" by turning the handwheel*
- Press the **P** key twice ➔ Exit programming at the technician level

*) Upon turning the handwheel, the position information goes off and the angular degrees of the position are displayed.

7.8.3 Setting the Positions on the V810 Control Panel (Parameter 270 = 0)

If no reference position has been set, or settings are to be changed, proceed as follows:

	Select parameter 171	➔	F – 171
E	Press the **E** key	➔	[o]
»	Press the >> key (B key). Display of the 1st parameter value of position 1.	➔	P1E 000
+ -	If necessary, change parameter value by pressing key >> or +/- or by turning the handwheel	➔	P1E XXX

E		Parameter value of position 2 appears on the display	➔	P 2 E 2 5 7
+	-	If necessary, change parameter value by pressing key >> or +/- or by turning the handwheel	➔	P 2 E X X X
E		Parameter value of position 1A appears on the display	➔	P 1 A 0 7 0
+	-	If necessary, change parameter value by pressing key >> or +/- or by turning the handwheel	➔	P 1 A X X X
E		Parameter value of position 2A appears on the display	➔	P 2 A 3 3 8
+	-	If necessary, change parameter value by pressing key >> or +/- or by turning the handwheel	➔	P 2 A X X X
P	P	Press the P key twice. Settings are completed. Exit programming.	➔	d A 3 2 1 G

These values are saved when you start sewing. They remain in effect even after turning the machine off! Storage without starting sewing is possible by using parameter 401.

7.8.4 Setting the Positions on the V820 Control Panel (Parameter 270 = 0)

If no reference position has been set, or settings are to be changed, proceed as follows:

			Display before programming	➔	4000 dA321G
P			A parameter number blinks on the display	➔	F–XXX
1	7	1	Input parameter number 171	➔	F-171
E			The abbreviation of the parameter appears on the display	➔	F-171 Sr2 [o]
F2			Display of the 1st parameter value of position 1 (B key)	➔	P1E 000
0	...	9	If necessary, change parameter value by pressing keys +/- or 0...9 or by turning the handwheel.	➔	P1E XXX
E			Parameter value of position 2 appears on the display	➔	P2E 257
0	...	9	If necessary, change parameter value by pressing keys +/- or 0...9 or by turning the handwheel.	➔	P2E XXX
E			Parameter value of position 1A appears on the display	➔	P1A 070
0	...	9	If necessary, change parameter value by pressing keys +/- or 0...9 or by turning the handwheel.	➔	P1A XXX
E			Parameter value of position 2A appears on the display	➔	P2A 338

0 ... 9		If necessary, change parameter value by pressing keys +/- or 0...9 or by turning the handwheel.	➔	P2A XXX
P	P	Settings are completed. Exit programming.	➔	4000 dA321G

Note
When setting the positions by turning the handwheel, make sure that the displayed numerical value changes.

The setting values of the positions are programmed in the factory. After setting the reference position the machine is ready for use. Changing these settings is necessary only on non-standard machines or for fine tuning.

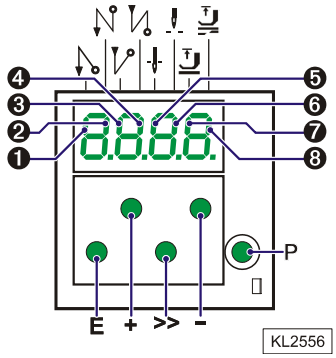
- The display unit of the set position values is "degrees".

7.9 Display of the Signal and Stop Positions

Function **with** or **without** control panel		Parameter
Display of positions 1 and 2	(Sr3)	**172**

The position settings can easily be checked using parameter 172.

- Select parameter 172
- The display shows "Sr3"
- Turn handwheel according to the direction of motor rotation



Control display (control panel not connected)

- Segment ❺ on corresponds to position 1
- Segment ❺ turns off corresponds to position 1A
- Segment ❻ on corresponds to position 2
- Segment ❻ turns off corresponds to position 2A

V810/V820/V850 control panel display

- Arrow above symbol "position 1" on key 4 (V810) / on key 7 (V820/V850) is displayed
  corresponds to position 1
- Arrow above symbol "position 1" on key 4 (V810) / on key 7 (V820/V850) is displayed
  corresponds to position 1A
- Arrow above symbol "position 2" on key 4 (V810) / on key 7 (V820/V850) is displayed
  corresponds to position 2
- Arrow above symbol "position 2" on key 4 (V810) / on key 7 (V820/V850) is displayed
  corresponds to position 2A

If the control panel is connected, the positions will be displayed only on the control panel!

7.10 Positioning Shift

Function **with** or **without** control panel		Parameter
Positioning shift	(PSv)	**269**

Through the use of parameter 269, fine tuning of the stop position can be accomplished. By setting a value ≥0, the position of the drive shifts by the set angular degrees to after the stop position set with the use of parameter 171.

7.11 Braking Characteristics

Function **with** or **without** control panel		Parameter
Braking effect when varying the preset value ≤ 4 stages Braking effect when varying the preset value ≥ 5 stages	(br1) (br2)	**207** **208**

- Parameter 207 regulates the braking effect between speed stages
- Parameter 208 influences the braking effect for the stop

The following applies to all setting values:
the higher the value, the stronger the braking reaction!

7.12 Braking Power at Standstill

Function **with** or **without** control panel		Parameter
Braking power at standstill	(brt)	**153**

This function prevents unintentional "wandering" of the needle at standstill.
The effect can be checked by turning the handwheel.

- The braking power is effective at standstill
  - at stop in the seam
  – after the seam end
- The effect can be set
- The higher the set value, the stronger the braking power

7.13 Starting Characteristics

Function **with** or **without** control panel		Parameter
Starting edge	(ALF)	**220**

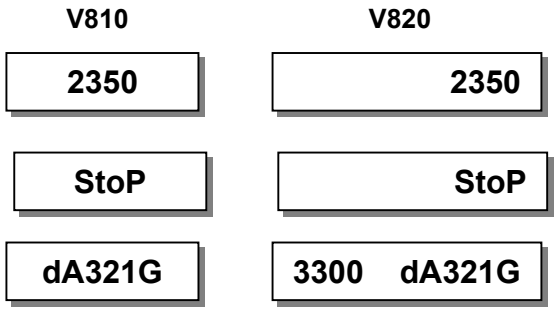
The drive acceleration dynamics can be adapted to the sewing machine characteristic (light/heavy).
- High setting value = high acceleration

With a high starting edge setting and, in addition, possibly high braking parameter values on a light machine, the characteristic may appear coarse. In this case, one should try to optimize the settings.

7.14 Actual Speed Display

Function **with** or **without** control panel		Parameter
Actual speed display	(nIS)	**139**

If parameter 139 = 1, the V810/820 display shows the following information:



During operation: ➔
- The actual speed
- **Example:** 2350 revolutions per minute

At stop in the seam: ➔
- The stop indication

At standstill after trimming: ➔
- On the V810, indication of the type of control
- On the V820/V850, indication of the set maximum speed and the type of control
- **Example:** 3300 revolutions per minute and type of control DA321G

8 Functions with or without Control Panel

8.1 Softstart

Function **with** or **without** control panel		Parameter
Softstart On/Off	(SSt)	**134**
Softstart On/Off (with function key when using V820/V850)	(-F-)	**008 = 1**
Softstart speed	(n6)	**115**
Number of softstart stitches	(SSc)	**100**

The letter symbols in parenthesis ( ) are visible only if a V820/V850 control panel is connected.

Functions:

- after power on
- at the beginning of a new seam
- speed pedal controlled and limited to (n6)
- lower speed of a parallel function prevailing (e. g. start backtack, stitch counting)
- stitch counting synchronized to position 1
- suspension with pedal in position 0 (neutral)
- interruption by full heelback (position -2)

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

8.2 Sewing Foot Lifting

Function **without** control panel		Key on control
Automatic in the seam	Segment 5 On	Key – (S4)
Automatic after thread trimming	Segment 6 On	

Function **with** control panel		V810	V820
Automatic in the seam	left-hand arrow above key On	Key 3	Key 6
Automatic after thread trimming	right-hand arrow above key On	Key 3	Key 6

Function **with** or **without** control panel		Parameter
Automatic sewing foot with pedal forward at the seam end if light barrier or stitch counting is On	(AFL)	**023**
Switch-on delay with pedal in position –1 (half heelback)	(t2)	**201**
Start delay after switching off the sewing foot lift signal	(t3)	**202**
Time of full power	(t4)	**203**
Duty ratio (ED) with pulsing	(t5)	**204**
Delay after thread wiping until sewing foot lifting	(t7)	**206**
Fast disabling of sewing foot lift On/Off	(FLS)	**216**
Time monitoring of sewing foot lift	(tFL)	**297**
Upper limit ON period of sewing foot lifting 1...100	(EF-)	**298**

Sewing foot is lifted:

- in the seam
  by half heelback (position -1)
  or automatically (using key **S4** on the control, segment 5 lights up)
  or automatically (using key **3** on the V810 control panel)
  or automatically (using key **6** on the V820/V850 control panel)
  by pressing the key for manual sewing foot lift
- after thread trimming
  by heelback (position -1 or -2)
  or automatically (using key **S4** on the control, segment 6 lights up)
  or automatically (using key **3** on the V810 control panel)
  or automatically (using key **6** on the V820/V850 control panel)
  by pressing the key for manual sewing foot lift
  automatically using the light barrier with pedal forward according to the setting of parameter 023
  automatically by stitch counting with pedal forward according to the setting of parameter 023
  switch-on delay after thread wiper (t7)

It is possible to prevent unintentional foot lifting before thread trimming when changing from pedal position 0 (neutral) to position -2 by setting a switch-on delay (t2) using parameter 201.

Note
The maximum time that the sewing foot can be lifted is limited by parameter 297. After the expiration of this term, the sewing foot is automatically lowered and can then be lifted again by half heelback (-1). From this moment the limitation time will again be effective.
If parameter 297 = 0, sewing foot monitoring is Off.

Holding power of the lifted foot:

The sewing foot is lifted by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid.
Set the duration of full power using parameter 203 and the partial holding power using parameter 204.

CAUTION!
If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid, and set the appropriate value according to the table below.

Value	Duty ratio (ED)	Effect
1	1 %	low holding power
100	100 %	high holding power (full power)

Sewing foot lowers:

- Press pedal to position 0 (neutral)
- Press pedal to position ½ (slightly forward)
- Release key for manual sewing foot lift
- After the time limit set with parameter 297

Upon pressing the pedal forward from lifted sewing foot, the start delay (t3), that can be set using parameter 202, becomes effective.
See also: chapter "Timing Diagrams".

8.3 Start Backtack

Function **without** control panel		Control
Single start backtack Double start backtack Start backtack Off	Segment 1 On Segment 2 On both segments Off	Key **E** (S2)

Function **with** control panel		V810/V820/V850
Single start backtack Double start backtack Start backtack Off	left-hand arrow above key On right-hand arrow above key On both arrows Off	Key 1

Function **with** or **without** control panel		Parameter
Stitch length during backtack	(SLu)	**137**
Speed for start backtack can be interrupted with pedal in pos. 0 (neutral)	(n2A)	**125**
Start and end backtack can be interrupted with pedal in position 0 (neutral)	(StP)	**284**

The start backtack starts by pressing the pedal forward at the beginning of the seam. From lifted sewing foot the backtack is delayed by the time t3 (start delay after switching off the sewing foot lift signal). The start backtack is executed automatically at speed n3. They cannot be interrupted. If softstart is running parallel, the respective lower speed is prevailing.

Whether or not an interruption of the start and end backtack is possible can be determined with **parameter 284**. It does not work with the ornamental backtack.

284 = 0 Automatic backtack cannot be interrupted

284 = 1 Backtack can be interrupted by pedal position 0 (neutral). The speed setting of parameter 125 is enabled. By pressing the pedal forward after an interrupted start backtack, the backtack can be continued; by half heelback (-1), the sewing foot can be lifted, or, by full heelback (-2), trimming without end backtack can be completed. The sewing foot is not automatically lifted when interrupting the backtack.

The stitch length (normal or long stitch) during backtack can be selected with **parameter 137**. The indicator does not light up during backtack.

137 = 0 Backtack is performed with long stitches.

137 = 1 Backtack is performed with normal stitch length.

Counting as well as switching the stitch regulator on and off is synchronized to position 1.
The stitch regulator will be switched off after completion of the backward section and the start backtack speed after a delay time t1. Then pedal control is returned.

8.3.1 Speed n3 at the Start of the Seam

Function **with** or **without** control panel		Parameter
Start backtack speed	(n3)	**112**

8.3.2 Stitch Counting for Start Backtack

Function **with** or **without** control panel		Parameter
Number of stitches forward Number of stitches backward	(c2) (c1)	**000** **001**

When using a control panel, the "HIT" function can be used for fast operator information. Upon switching the start backtack on by pressing key **1,** the corresponding value is displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

8.3.3 Stitch Correction and Speed Release

Function **with** or **without** control panel		Parameter
Stitch correction time Delay until speed release after start backtack	(t8) (t1)	**150** **200**

Speed release after single and double backtack can be influenced by parameter 200.

In the case of slow backtack mechanisms it is possible to delay disabling of the stitch regulator in the single and double start backtack by the time t8 (start backtack stitch correction) and thereby prolong the backward section. This time-lag can be selected using parameter 150.

8.3.4 Double Start Backtack

The forward section will be sewn for a number of stitches that can be set. Then the stitch regulator signal will be issued and the backward section will be executed. The number of stitches for the two sections can be set separately.

8.3.5 Single Start Backtack

The backtacking signal will be issued and the backward section will be executed for a number of stitches that can be set.

8.4 End Backtack

Function **without** control panel		Control
Single end backtack Double end backtack End backtack Off	Segment 3 On Segment 4 On both segments Off	Key **+** (S3)

Function **with** control panel		V810	V820/V850
Single end backtack Double end backtack End backtack Off	left-hand arrow above key On righ-thand arrow above key On both arrows Off	Key 2	Key 4

Function **with** or **without** control panel		Parameter
Stitch length during backtack	(SLu)	**137**
Speed for end backtack can be interrupted with pedal in pos. 0 (neutral)	(n2E)	**126**
Start and end backtack can be interrupted with pedal in position 0 (neutral)	(StP)	**284**

The end backtack starts by heelback, in a seam with stitch counting at the end of counting, or, from the light barrier seam at the end of the light barrier compensating stitches. The stitch regulator is immediately enabled from machine standstill. After lowering the sewing foot, the switch-on point of the signal is delayed by the time t3 (start delay after switching off the sewing foot lift signal). The first leading edge of position 1 counts as 0 stitch whenever the function is not started in position 1. Counting and switching the stitch regulator off is synchronized to position 1.
End backtack as well as end stitch condensing are performed automatically at speed n4. They cannot be interrupted.
From full machine run, the end backtack will be switched in only after having reached the speed n4 and synchronization to position 1.

Whether or not an interruption of the start and end backtack is possible can be determined with **parameter 284**. It does not work with the ornamental backtack.
284 = 0 Automatic backtack cannot be interrupted
284 = 1 Backtack can be interrupted by pedal position 0 (neutral). The speed setting of parameter 125 is enabled.
By pressing the pedal forward after an interrupted end backtack, the backtack can be continued; by half heelback (-1), the sewing foot can be lifted, or, by full heelback (-2), trimming without end backtack can be completed. The sewing foot is not automatically lifted when interrupting the backtack.

The stitch length (normal or long stitch) during backtack can be selected with parameter 137. The indicator does not light up during backtack.
137 = 0 Backtack is performed with long stitches.
137 = 1 Backtack is performed with normal stitch length.

8.4.1 Speed n4 at the Seam End

Function **with** or **without** control panel		Parameter
End backtack speed	(n4)	**113**

8.4.2 Stitch Counting for End Backtack

Function **with** or **without** control panel		Parameter
Number of stitches forward	(c3)	**002**
Number of stitches backward	(c4)	**003**

The end backtack stitches backward or forward can be programmed and varied using the above parameters directly on the control or on a connected V810/V820/V850 control panel.

When using a control panel, the “HIT” function can be used for fast operator information. Upon switching the end backtack on by pressing key **2** (V810) or **4** (V820/V850), the corresponding value is displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key **+** or **-**.

8.4.3 Stitch Correction and Last Stitch Backward

Function **with** or **without** control panel		Parameter
Trimming stitch forward / backward / with or without thread clamp Stitch correction time	(FAr) (c9)	**136** **151**

The backtack solenoid can be delayed in the double end backtack by selecting a stitch correction time (t9) using parameter 151.
For some sewing procedures it is desirable that the backtack solenoid in the single end backtack is disabled only after trimming. These functions can be selected using **parameter 136**.

136 = 0 Trimming stitch forward and thread wiper On.
136 = 1 Trimming stitch backward and thread wiper On.
136 = 2 Trimming stitch forward with short trimmer signal. Thread wiper Off.
136 = 3 Trimming stitch forward with stitch length reduction signal during softstart and short trimmer signal. Thread wiper Off.
136 = 4 Trimming stitch forward with stitch length reduction signal during softstart. Thread wiper Off.

8.4.4 Double End Backtack

The backward section and/or end stitch condensing will be executed for a number of stitches that can be set. Then the stitch regulator will be disabled and the forward section and/or normal stitch condensing stitches will be executed. The number of stitches for the two sections can be set separately.
After stitch counting (parameter 003) the trimming function will be initiated. During the entire operation the sewing speed is reduced to speed n4, with the exception of the last stitch, which will be performed at positioning speed n1.
In the case of slow backtack mechanisms it is possible to delay disabling of the stitch regulator in the single and double end backtack by the time t9 (end backtack stitch correction).

8.4.5 Single End Backtack

The stitch regulator signal will be issued and the backward section will be executed for a number of stitches that can be set. During the last stitch the speed is reduced to positioning speed.

8.4.6 Backtack Synchronization

Function **with** or **without** control panel		Parameter
Backtack synchronization for end backtack On/Off Backtack synchronization speed	(nSo) (nrS)	**123** **124**

If parameter 123 is on, the backtack speed will be switched to backtack synchronization speed one stitch before engaging and disengaging of the backtack solenoid. The backtack speed is released at the next position 2. If the synchronization speed, that can be set using parameter 124, is higher than the backtack speed, the latter is maintained. Backtack synchronization is possible only in end backtack.

8.5 Start Ornamental Backtack

Function **without** control panel		Control
Single start ornamental backtack Double start ornamental backtack Start ornamental backtack Off	Segment 1 On Segment 2 On both segments Off	Key **E** (S2)

Function **with** control panel		V810/V820/V850
Single start ornamental backtack Double start ornamental backtack Start ornamental backtack Off	left-hand arrow above key On right-hand arrow above key On both arrows Off	Key 1

Function **with** or **without** control panel		Parameter
Number of ornamental backtack stitches forward	(SAv)	**080**
Number of ornamental backtack stitches backward	(SAr)	**081**
Start backtack speed	(n3)	**112**
Function “ornamental backtack” On/Off	(SrS)	**135**
Start delay after switching off the sewing foot lift signal	(t3)	**202**
Ornamental backtack stop time	(tSr)	**210**
Last counted forward section in the start ornamental backtack On/Off	(Zrv)	**215**

The letter symbols in parenthesis ( ) are visible only if a V820/V850 control panel is connected.

Difference from the standard start backtack:

- The drive stops for stitch regulator switching.
- The stop time can be set.
- After the backtack section backward follows a backtack section forward with the same number of stitches as the backward section according to the setting of parameter 215.
- The number of ornamental backtack stitches can be set with separate parameters.

The stitch length (normal or long stitch) during backtack can be selected with parameter 137. The indicator does not light up during backtack.
137 = 0 Backtack is performed with long stitches.
137 = 1 Backtack is performed with normal stitch length.

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

Function **with** control panel		Parameter
Ornamental backtack On/Off	(-F-)	**008 = 2**

8.6 End Ornamental Backtack

Function **without** control panel		Control
Single end ornamental backtack	Segment 3 On	Key **+** (S3)
Double end ornamental backtack	Segment 4 On	
End ornamental backtack Off	both segments Off	

Function **with** control panel		V810	V820/V850
Single end ornamental backtack	left-hand arrow above key On	Key 2	Key 4
Double end ornamental backtack	right-hand arrow above key On		
End ornamental backtack Off	both arrows Off		

Function **with** or **without** control panel		Parameter
Number of ornamental backtack stitches backward	(SEv)	**082**
Number of ornamental backtack stitches forward	(SEr)	**083**
End backtack speed	(n4)	**113**
Function “ornamental backtack” On/Off	(SrS)	**135**
Start delay after switching off the sewing foot lift signal	(t3)	**202**
Ornamental backtack stop time	(tSr)	**210**

The letter symbols in parenthesis ( ) are visible only if a V820/V850 control panel is connected.

Difference from the standard end backtack:

- The drive stops for stitch regulator switching
- The stop time can be set
- The number of ornamental backtack stitches can be set with separate parameters.

The stitch length (normal or long stitch) during backtack can be selected with parameter 137. The indicator does not light up during backtack.
137 = 0 Backtack is performed with long stitches.
137 = 1 Backtack is performed with normal stitch length.

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

Function **with** control panel		Parameter
Ornamental backtack On/Off	(-F-)	**008 = 2**

8.7 Intermediate Backtack/Intermediate Ornamental Backtack

Upon pressing an external key on socket A/5-33, the backtack solenoid can be switched on anywhere in the seam and at standstill. The speed limitation of parameter 288 or 289 becomes effective according to the setting of parameters 135 and 287.
See List of Parameters chapter **Connection Diagram.**

Function **with** or **without** control panel		Parameter
Counted manual backtack On/Off	(chr)	**089**
Speed limitation DB3000 for manual backtack On/Off	(dbA)	**287**
Speed limitation for manual ornamental backtack	(n9)	**288**
Speed limitation for manual backtack	(n11)	**289**

Intermediate backtack:

As long as the key is pressed down, backward sewing with speed limitation (parameter 289), or backward sewing depending on pedal actuation in accordance with the setting of parameter 287 is performed.

Moreover, it is possible to select using **parameter 089** if, after releasing the key at the end of the manual backtack, the speed limitation (n11) is to be immediately released or prolonged by a stitch count.
089 = 0 Manual backtack **without** prolongation of the speed limitation
089 = 1...255 Number of stitches for the prolongation of the speed limitation after completion of the intermediate backtack

Intermediate ornamental backtack:

Upon pressing the key in the seam, the drive stops in position 1. The backtack solenoid is enabled.
After the intermediate ornamental backtack stop time (parameter 210) has elapsed and the pedal has been pressed forward, the drive runs at intermediate ornamental backtack speed, and the stitches are counted while the key is still held down. The drive stops again in position 1. The backtack solenoid is disabled.
After the ornamental backtack stop time has elapsed the previously counted number of stitches will be repeated in a forward direction. The speed limitation is released upon completion of the count.
The entire sequence is performed with speed limitation n9.

8.8 Backtack Suppression/Recall

Effective in standard and ornamental backtack

The next backtack operation can be suppressed or recalled once by pressing an external key on socket A/14-33. This is acknowledged by a light emitting diode connected to socket A/24. It goes off when the backtack function is completed or the key is pressed again.

Upon pressing	Start backtack On	Start backtack On	End backtack On	End backtack On
Before start of seam	No backtack	Backtack	---	---
In the seam	---	---	No backtack	Backtack

The double backtack is performed in the above cases.
See List of Parameters chapter **Connection Diagram.**

8.9 Holding Power of the Stitch Regulator Solenoid

Function **with** or **without** control panel		Parameter
Time of full power	(t10)	**212**
Holding power of the stitch regulator solenoid	(t11)	**213**
Upper limit stitch regulator ON period	(EV-)	**299**

The stitch regulator solenoid is engaged by full power. Then the system switches automatically to partial power in order to reduce the load for the control and the connected solenoid. Set the duration of full power using parameter 203 and the partial holding power using parameter 204.

CAUTION!
If the holding power is set too high, the solenoid and the control may be permanently damaged. Please observe the permissible duty ratio (ED) of the solenoid and set the appropriate value according to the table below.

Value	Duty ratio (ED)	Effect
1	1 %	low holding power
100	100 %	high holding power (full power)

8.10 Reverse Motor Rotation

Function **with** or **without** control panel		Parameter
Positioning speed	(n1)	**110**
Reversing angle	(ird)	**180**
Switch-on delay of reverse motor rotation	(drd)	**181**
Reverse motor rotation On/Off	(Frd)	**182**

The function "reverse motor rotation" is performed after trimming. When the stop position is reached, the drive stops for the duration of the switch-on delay of reverse motor rotation (parameter 182). It then runs in reverse direction at positioning speed by the angle set using parameter 180. After reversion, the thread wiper will be activated for the time t6.

8.11 Machine Run Blockage (Safety Switch)

CAUTION!
This is not a safety function. The line voltage must still be switched off during maintenance and repair work.

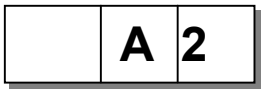
Function **with** or **without** control panel		Parameter
New sewing start after machine run blockage	(PdO)	**281**
Functioning of the switch for machine run blockage	(LOS)	**282**
Function “machine run blockage”	(LSP)	**283**

Select how the drive is restarted after deactivating machine run blockage using **parameter 281**.
281 = 0 Immediate start from any pedal position
281 = 1 Start only with pedal in position 0 (neutral)

Determine the functioning of the safety switch using **parameter 282**.
282 = 0 Make contact [N.O.] (switch closed = machine run blockage On)
282 = 1 Break contact [N.C.] (switch open = machine run blockage On)

Switch the function “machine run blockage” using **parameter 283**.
283 = 0 Machine run blockage Off
283 = 1 Function “machine run blockage” 1 (safety function) fastest stop without positioning
283 = 2 Function “machine run blockage” 2 (control function) with positioning in the actual position

The function “machine run blockage” is enabled by connecting a switch to socket A/11-33. When using a control panel, an acoustic signal can be switched on and/or off using parameter 127.

Display after enabling machine run blockage without control panel:
Control display ➔ 

Display and signal after enabling machine run blockage with control panel:
V810 control panel display.
(Symbol blinking. Acoustic signal if parameter 127 = 1) ➔

V820/V850 control panel display.
(Stop blinking. Acoustic signal if parameter 127 = 1) ➔ **-Stop-**

In all variants of the function “machine run blockage” sewing foot lifting is possible, needle up/down or its variants, however, is not.

8.11.1 Machine Start Blockage (Blockage 1 and 2)

If the input “machine run blockage“ is activated at machine standstill, the run of the drive is blocked despite pressing the pedal. Machine start is possible only after deactivating the input.

8.11.2 Function “Machine Run Blockage” 1 (Safety Function) Parameter 283 = 1

In the start backtack:
- Fastest stop without positioning. The start backtack will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the start backtack and the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the free seam:
- Fastest stop without positioning.
- Trimming is impossible.
- After deactivating the machine run blockage the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

During stitch counting:
- Fastest stop without positioning. Stitch counting will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage stitch counting will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

During the light barrier compensating stitches:
- Fastest stop without positioning. The light barrier compensating stitches will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the light barrier compensating stitches will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the end backtack:
- Fastest stop without positioning. The end backtack will be interrupted.
- Trimming is impossible.
- After deactivating the machine run blockage the end backtack will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

8.11.3 Function "Machine Run Blockage" 2 (Control Function) Parameter 283 = 2

In the start backtack, during stitch counting and the light barrier compensating stitches:
- Stop in the selected position.
- Trimming without end backtack by full heelback is possible when machine run blockage is On. In this case, a new seam will be started after deactivating machine run blockage.
- After deactivating the machine run blockage the start backtack or stitch counting will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the free seam:
- Stop in the selected position.
- Trimming without end backtack by full heelback is possible when machine run blockage is On. In this case, a new seam will be started after deactivating machine run blockage.
- After deactivating the machine run blockage the seam will be continued by pressing the pedal to position >1, or thread trimming will be initiated by full heelback (–2).

In the end backtack:
- The end backtack will be completed with a stop in the selected position. The start of the next seam is blocked.
- Trimming by full heelback is possible when machine run blockage is On.
- After deactivating the machine run blockage the sewing operation will be completed by thread trimming by half heelback, unless the thread has been trimmed before.
- If the thread is trimmed when machine run blockage is On, a new seam will be started after deactivating the machine run blockage.

During thread trimming:
- Thread trimming will be completed. The start of the next seam is blocked.
- After deactivating the machine run blockage the start of the next seam is possible.

8.12 Bobbin Thread Monitor

Function **with** or **without** control panel		Parameter
Stop after completion of bobbin thread monitor stitch counting	(cFw)	**085**
Stop after completion of bobbin thread monitor stitch counting (setting of pa. 195 = 4)	(cF4)	**086**
Bobbin thread monitor On/Off	(rFw)	**195**

If the bobbin thread monitor function is On (parameter 195 = 1...4), the type of control and the set maximum speed are displayed for 1 sec. After power On.

Display of maximum speed: ➔ **4000 dA321G** ← **Type of control**
(e. g. 4000 RPM)

Then the bobbin thread monitor status display appears.

Number of bobbin thread monitor stitches: ➔ **250 --II--** ← **Status display**
(e. g. 250 stitches)

At this point (after power On) the number of stitches can be regulated in steps of 10 with the +/- key.
The function **DED = Direct Input of Speed Limitation** is available only after having started sewing or trimming.

8.12.1 Input Signals

The form of input signal helps distinguish which of the bobbins is empty.

Right-hand bobbin empty: = Continuous signal (min. 1 sec.)
Left-hand bobbin empty: = Frequency 5 Hz or signal for approx. 100 msec
Left-hand and right-hand bobbin empty: = Frequency 10 Hz or signal for approx. 50 msec

8.12.2 Bobbin Thread Monitor Function Off (Parameter 195 = 0)

The bobbin thread monitor function is Off.

8.12.3 Bobbin Thread Monitor without Stop / Sewing Foot Down after Seam End (Parameter 195 = 1)

After the bobbin is empty, the bobbin thread counter is activated when identifying an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820/V850 control panel. After counting, **C** is displayed for the left-hand bobbin and **D** for the right-hand bobbin on the V810 control panel. On the V820/V850 control panel, another symbol for the right-hand, left-hand bobbin or both bobbins is displayed instead of the type designation. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (right-hand, left-hand or both). The displays remain on even if the input signal is no longer received. The sewing foot is not lifted after thread trimming and after counting. The sewing foot is lifted only after the pedal has been heeled back from position 0 (neutral). The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

8.12.4 Bobbin Thread Monitor with Stop / Sewing Foot Up after Seam End (Parameter 195 = 2)

After the bobbin is empty, the bobbin thread counter is activated when identifying an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820/V850 control panel. After counting, **C** is displayed for the left-hand bobbin and **D** for the right-hand bobbin on the V810 control panel. On the V820/V850 control panel, another symbol for the right-hand, left-hand bobbin or both bobbins is displayed instead of the type designation. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (right-hand, left-hand or both), and the drive stops. Even automatic seam sections like seams with stitch counting or light barrier seams are interrupted. They can be completed by pressing the pedal forward from position 0 (neutral).
Note the following exceptions:

- If bobbin thread counting is completed in the start backtack, the latter will be completed and the drive stops.
- If bobbin thread counting is completed in the end backtack, the latter will be fully completed with the thread trimming operation.

After thread trimming the sewing foot is automatically lifted. The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

8.12.5 Bobbin Thread Monitor with Stop / Sewing Foot Down after Seam End (Parameter 195 = 3)

After the bobbin is empty, the bobbin thread counter is activated when identifying an input signal, and the bobbin thread monitor symbol blinks on the display of the V810 or V820 control panel. After counting, **C** is displayed for the left-hand bobbin and **D** for the right-hand bobbin on the V810 control panel. On the V820/V850 control panel, another symbol for the right-hand, left-hand bobbin or both bobbins is displayed instead of the type designation. Furthermore, the respective LEDs blink with approx. 4 Hz on the machine (right-hand, left-hand or both), and the drive stops. The sewing foot is not lifted after thread trimming. The sewing foot is lifted only after the pedal has been heeled back from position 0 (neutral).
The displays go off (the blinking frequency of 4 Hz is switched off), if no more input signals are received after thread trimming and the subsequent sewing start after 14 stitches. This is an indicator that the bobbin has been replaced, and the bobbin thread counter is reset to zero.

8.12.6 Bobbin Thread Monitor with Stitch Counting (Parameter 195 = 4)

In order to work with different bobbins and to use the thread monitor function, 3 stitch counts can be programmed (A, B, C; parameters 086, 087 and 088).
After inserting an EPROM, but before initial operation of a control, these counters must be programmed.

Programming during initial operation (after EPROM replacement)

Call up parameter 195, set to 4 (display example for V820)

P	P	Press the **P** key twice.	➔	3500 dA321G
8		Press key **8** (>1 sec.). Display flashing.	➔	0000 A--||--

8	Press key **8** (<1 sec.). Flashing Off.	➔	0100 A--||--
+	Press key +. Display flashing.	➔	0000 B--||--
8	Press key **8** (<1 sec.). Flashing Off.	➔	0200 B--||--
+	Press key +. Display flashing.	➔	0000 C--||--
8	Press key **8** (<1 sec.). Flashing Off.	➔	0300 C--||--

Enable/Disable Thread Monitor Function
The thread monitor stitch count (max. 9990 stitches) is activated by keeping a key pressed (>1 sec.) that is connected to socket A/12. The thread monitor symbols are continuously displayed.
When a V820 control panel is connected, the function can be activated using key 8.
The function is deactivated by pressing the key again.
The function "Direct Input of Maximum Speed (DED)" is possible only if the thread monitor function is Off.

Select Stitch Counters (A, B, or C)
The stitch counter can be selected at the start of the seam by pressing key +/- on the control panel. The stitch counter last used and the counter readings are saved and remain in effect even after the power is Off.

Reset Stitch Counters (A, B, or C)
By pressing the key briefly (<1 sec.), the selected stitch counter is reset to the value selected using parameter 086, 087 or 088.

Sequence with Enabled Thread Monitor Function
During sewing the counter reading is decremented with each stitch. The remaining number of stitches is displayed at each intermediate stop.
On the V810 control panel, the completion of the count is signaled by the symbol **C** for the left-hand bobbin and **D** for the right-hand bobbin. On the V820 control panel, the completion of the count is indicated by flashing symbols for the left-hand and/or right-hand bobbin instead of the type designation. In addition, the LEDs provided for this function will flash (flash frequency 4 Hz).
The drive stops.
With the exception of start and end backtack, automatic seam sections such as seams with stitch counting or light barrier seams are interrupted. After pressing the pedal forward from position 0 (neutral), the seam can be continued.
The number of stitches should be set so that after completion of the count the bobbin is not completely empty.
After replacing the bobbin, the thread monitor count is reset to the initial state by briefly pressing the above mentioned key.
The counter reading will be saved after power Off, and the thread monitor count continued after power On.

8.13 Needle Cooling / Under-Edge Trimmer

Function **with** or **without** control panel		Parameter
Needle cooling On/Off	(nk)	**095**
Switch speed for needle cooling On/Off	(nnk)	**120**
Switch-off delay of needle cooling after stop	(dnk)	**183**
Needle cooling/under-edge trimmer function	(Fnk)	**185**

The function of the output "needle cooling" can be programmed using **parameter 185**.
185 = 1 Needle cooling is switched on during the entire sewing operation. Switching off after the stop can be delayed (parameter 183).
185 = 2 The output "under edge trimmer" will be enabled by pressing the pedal forward.
185 = 3 Needle cooling is enabled depending on the speed. The corresponding switch speed can be set using parameter 120.

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

Function **with** control panel		Parameter
Needle cooling On/Off	(-F-)	**008 = 4**

8.14 Function Modules for Outputs A / B / C

Easy programming of functional sequences is possible using the function modules A / B / C.
1 input, 1 output and 1 LED each are assigned to the modules. A signal on the module inputs influences the reaction on the outputs assigned to them according to the table and, inter alia, sewing process, backtacking and speed limitation.

Module	A	B	C
Input / Socket	in4 / A/8	in1 / A/7	in7 / A/9
Output / Socket	M6 / A/30	M16 / A/20	M30 / A/15
LED (output) / Socket	M10 / A/29	M11 / A/31	M18 / A/22

8.14.1 Function Modules A / No Function

- Parameter 250 = 0: Function module for output A is switched off.

8.14.2 Switch Stitch Length (Function Module A)

Function **with** or **without** control panel		Parameter
Switch stitch length with output A	(FmA)	**250 = 1**
Light barrier compensating stitches for long stitch length	(LS)	**004**
Light barrier compensating stitches for normal stitch length	(cLS)	**010**
Output A remains active or becomes inactive after the seam end	(AFA)	**251**
Output A inverted/not inverted	(Ain)	**252**
Speed limitation DB3000	(n11)	**289**

- If output A is activated, the normal stitch length is effective. LED A is off.
- Output A can be inverted with parameter 252.
- After power On, the normal stitch length will be switched on, i.e. output A = On and LED A = Off.
- By pressing the A key, output A is switched off and LED A is switched on.
- When the key is pressed again, the status after power On is reset.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.
- When completing the seam by light barrier, different parameters (004, 010) apply to the two light barrier stitch counts.

8.14.3 Single Stitch with Short Stitch Length (Function Module A)

Function **with** or **without** control panel		Parameter
Single stitch with reduced stitch length	(FmA)	**250 = 4**

- Output A will be switched on by pressing a key after the start of sewing, at intermediate stop and with the sewing foot down. One full rotation will be performed on condition that the drive had been positioned in position 1.
- If the key remains pressed down and the pedal is pressed forward after a single stitch, output A and LED A remain On. Sewing is performed with short stitch length until the key is pressed again, or output A and LED A are switched off by the end backtack or the thread trimmer.
- If the A key is pressed during sewing, or sewing is started when pressing the key, output A and LED A will be switched on.
- Output A and LED A will be switched off by pressing the key again or by the end backtack or the thread trimmer.
- A manual backtack is impossible when output a is switched on.
- Pressing a key during automatic seams by stitch counting or light barrier has no effect.

	Output A	LED A	Remark
Power On	Off	Off	
A key after start of sewing Sewing foot down	On for one rotation	On	
Press A key during sewing, or press A key first and then start	On, sewing with short stitch length	On	Manual backtack impossible
End backtack without thread trimming	Off	Off	

8.14.4 Lift/Lower Roller (Function Module A)

Function **with** or **without** control panel		Parameter
Lift/lower roller (output A)	(FmA)	**250 = 5**
Number of stitches until lowering the roller	(cA)	**253**
Time interval which can be varies by the number of stitches set with parameter 253 On/Off	(PLc)	**260**
Roller lifting depending on sewing foot lift and backtack	(FLk)	**261**
When enabling high lift for walking foot, roller remains lowered/lifted	(hPt)	**262**

- After power On, output A and LED A are switched on.
- By pressing a key after power On before starting the seam output A and LED A are switched off.
- By pressing the key again after power On before starting the seam the roller function and LED A is switched on. Output A remains on (roller up).
- After the start of the seam (roller function on) the roller will be lowered after a number of stitches that can be set (parameter 253) after the start backtack has been completed (if start backtack off, at the start of the seam). The function of the set stitches can be enabled and disabled using parameter 260. Counting can be interrupted by pressing a key. The roller is immediately lowered.
- If the sewing foot is lifted and the roller is down, the roller is also lifted. After the sewing foot has been lowered, the roller is also lowered after the number of stitches set with parameter 253. Counting can be interrupted by pressing a key. The roller is immediately lowered. If the number of stitches is set to 0, the roller is immediately lowered together with the sewing foot.
- Whenever a manual backtack is performed with the roller down, the roller is immediately lifted. After the backtack the roller is immediately lowered.
- When the key is pressed for the first time during the sewing operation, the roller function is disabled. The roller is lifted and LED A goes off. This status remains until the key is pressed again (even after thread trimming). By pressing the key once more the roller function is enabled again. The roller is lowered and LED A switched on.
- The roller is lifted when starting the end backtack or the thread trimmer.

	Output A	LED A	Roller	Sewing foot lift
Power On	On	On	up	
A key	Off	Off	down	
Press A key once more	On	On	up	
In the start backtack	On	On	up	down
After the start backtack during counting *)	On	On	up	down
A key, after the start backtack during counting *)	Off	Off	down	down
After the start backtack after counting *)	Off	Off	down	down
Manual backtack	On	On	up	down
Sewing foot up	On	On	up	up
After actuating the sewing foot during counting *)	On	On	up	down
A key after actuating the sewing foot during counting *)	Off	Off	down	down
A key in the seam	On	On	up	
A key once more in the seam	Off	Off	down	
In the end backtack and during thread trimming	On	On	up	down
After thread trimming if roller On	On	On	up	
After thread trimming if roller Off	On	On	up	

*) Number of stitches until output A is enabled (parameter 253).

The following functions can be set using **parameter 261**:
261 = 0 The roller is lifted without sewing foot lift and backtack.
261 = 1 The roller is lifted with sewing foot lift and backtack.
261 = 2 The roller is lifted with sewing foot lift. After the sewing foot has been lowered, the roller will be lowered after the number of stitches set with parameter 253 and their enabling using parameter 260, or pressing a key.
261 = 3 The roller is lifted with the backtack. After the backtack the roller will be immediately lowered. If the roller is lifted when activating the intermediate backtack, it remains lifted until after completing the backtack.

The following function can be set using **parameter 262** if parameter 250 is et at "11" and 255 at "5" or parameter 250 at "5" and 255 at "11".
262 = 0 The roller remains lowered when enabling high lift for walking foot.
262 = 1 The roller is lifted when enabling high lift for walking foot.

8.14.5 Lift/Lower Fabric Stop (Function Module A)

Function **with** or **without** control panel		Parameter
Lift/lower fabric stop (output A) Output A inverted / not inverted	(FmA) (Ain)	**250 = 6** **252**

- The fabric stop is lifted by enabling output A. It is effective if output A is off. LED A lights up when the fabric stop is down or output A is off.
- After power On, output A is On and LED A is Off.
- Output A can be inverted with parameter 252.
- By pressing a key, output A is switched off and LED A is switched on. The fabric stop is effective. This status is maintained until after thread trimming and can be cancelled only by pressing the key again or by power Off/On.
- If the sewing foot is lifted, the fabric stop is as well lifted. Output A is switched on and LED A remains on.
- If the sewing foot is lowered, the fabric stop is as well lowered. Output A is switched off and LED A remains on.
- By pressing the key again, the fabric stop is disabled. Output A is switched on and LED A is switched off. This status is maintained until after thread trimming and can be cancelled only by pressing the key again.

	Output A	LED A	Fabric stop	Sewing foot lift
Power On	On	Off	up	
Press A key; sewing foot up	On	On	up	up
Press A key once more; sewing foot up	On	Off	up	up
Press A key once more; sewing foot down	Off	On	down	down
Sewing foot up	On	On	up	up
After thread trimming and sewing foot up	On	On	up	up
After thread trimming and sewing foot down	Off	On	down	down

8.14.6 Second Thread Tension (Function Module A)

Function **with** or **without** control panel		Parameter
Second thread tension (output A) Output A remains active or becomes inactive after the seam end Output A inverted / not inverted	(FmA) (AFA) (Ain)	**250 = 7** **251** **252**

- The second thread tension can be enabled or disabled as desired, not however, during automatic seam sections.
- After power On, output A and LED A are switched off.
- Output A can be inverted with parameter 252.
- By pressing the key for the first time, output A and LED A are switched on.
- By pressing the key for the second time, output A and LED A are switched off again.
- If parameter 251 = 1, the status after power On will be activated after thread trimming.

Functional sequence if ➔	Parameter 252 = 0		Parameter 252 = 1	
	Output A	LED A	Output A	LED A
Power On	Off	Off	On	Off
Press A key	On	On	Off	On
Press A key again or thread trimming if parameter 251 = 1	Off	Off	On	Off

8.14.7 Manual Edge Trimmer (Function Module A)

Function **with** or **without** control panel		Parameter
Manual edge trimmer (output A)	(FmA)	**250 = 8**
Output A remains active or becomes inactive after the seam end	(AFA)	**251**

The edge trimmer is enabled by activating output A. If parameter 251 = 1, the edge trimmer will be disabled after thread trimming.

- After power On, the edge trimmer and LED A are switched off.
- The edge trimmer can be enabled any time by pressing the A key (output A and LED A On).
- The edge trimmer is disabled by pressing the key again (output A and LED A Off).
- If parameter 251 = 1, the edge trimmer will be activated after thread trimming as after power On.

	Output A	LED A	Remark
Power On	Off	Off	Edge trimmer Off
Press A key	On	On	Edge trimmer On
Press A key again	Off	Off	Edge trimmer Off
After thread trimming if pa. 251 = 1	Off	Off	Edge trimmer Off

8.14.8 Automatic Edge Trimmer (Function Module A)

Function **with** or **without** control panel		Parameter
Automatic edge trimmer (output A)	(FmA)	**250 = 9**
Edge trimmer remains active at the seam end as before thread trimming, or it will be activated as after power On	(AFA)	**251**
Number of stitches until enabling the edge trimmer	(cA)	**253**
Number of stitches until disabling the edge trimmer	(cA_)	**254**
Edge trimmer influences sewing foot lifting On/Off	(kFk)	**267**

The edge trimmer is enabled by activating output A (M6 on socket A/30). This is indicated by LED A (M10 on socket A/29). The starting torque of the edge trimmer is determined using parameter 253 (number of stitches). The edge trimmer ON period is set using parameter 254 (number of stitches).

The following operational statuses are possible:

Automatic operation:	Parameter 253 >0,	Parameter 254 >0,	Parameter 251 = 0	or	Parameter 251 = 1
Semiautomatic operation:	Parameter 253 >0,	Parameter 254 = 0,	Parameter 251 = 0	or	Parameter 251 = 1
	Parameter 253 = 0,	Parameter 254 >0,	Parameter 251 = 0	or	Parameter 251 = 1
Manual operation:	Parameter 253 = 0,	Parameter 254 = 0,	Parameter 251 = 0	or	Parameter 251 = 1

251 = 0 The edge trimmer switching state is maintained as before thread trimming.
251 = 1 The edge trimmer switching state is set as after power On.

267 = 0 The edge trimmer remains On, independently of sewing foot lifting.
267 = 1 The edge trimmer is disabled when the sewing foot is lifted.

Automatic Operation:

Parameter 253 > 0, 254 > 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254	On	On	Counting can be interrupted with the A key
End counting pa. 254	Off	Off	
Press A key	On	On	Manual enabling
Press A key	Off	Off	Manual disabling
After thread trimming	Off	Off	

Semiautomatic Operation:

Parameter 253 > 0, 254 = 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254 = 0	On	On	Edge trimmer disabled only manually
Press A key	Off	Off	Manual disabling
After thread trimming	Off	Off	

Parameter 253 > 0, 254 = 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253	Off	Blinking	Counting can be interrupted with the A key
End counting pa. 253	On	On	
Start counting pa. 254 = 0	On	On	Edge trimmer disabled only manually
After thread trimming	Off	Off	Status as after power On

Parameter 253 = 0, 254 > 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253 = 0	Off	Off	
Press A key	On	On	Trigger key On (special case)
Start counting pa. 254	On	On	
End counting pa. 254	Off	Off	
Press A key	On	On	Manual enabling
Press A key	Off	Off	Manual disabling
After thread trimming	Off	Off	

Parameter 253 = 0, 254 > 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam	On	On	
Press A key again before start of the seam	Off	Off	
After start of the seam counting pa. 253 = 0	Off	Off	
Press A key	On	On	Trigger key On (special case)
End counting pa. 253	On	On	
Start counting pa. 254	On	On	
End counting pa. 254	Off	Off	
Press A key	On	On	Manual enabling
After thread trimming	Off	Off	

Manual Operation:

Parameter 253 = 0, 254 = 0, 251 = 0	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam or in the seam	On	On	
Press A key before start of the seam or in the seam	Off	Off	
Press A key before start of the seam or in the seam	On	On	
After thread trimming	On	On	

Parameter 253 = 0, 254 = 0, 251 = 1	Output A	LED A	Remark
Power On	Off	Off	
Press A key before start of the seam or in the seam	On	On	
Press A key before start of the seam or in the seam	Off	Off	
Press A key before start of the seam or in the seam	On	On	
After thread trimming	Off	Off	

8.14.9 High Lift for Walking Sewing Foot (Function Module A)

Function **with** or **without** control panel		Parameter
High lift for walking foot with output A	(FmA)	**250 = 11**
High lift walking speed	(n10)	**117**
High lift for walking foot operational mode stored = 1 / not stored = 0	(hPr)	**138**
Run-out time of high lift walking speed after disabling high lift for walking foot	(thP)	**152**
Minimum number of stitches during high lift for walking foot	(chP)	**184**
When enabling high lift for walking foot, the roller remains lowered/lifted	(hPt)	**262**

By pressing the A key, output A and LED A are switched on and set to maximum high lift. The solenoid valve can be switched on any time. The maximum speed is limited to high lift walking speed (DB2000). If the actual speed is higher than high lift walking speed, the drive slows down to high lift walking speed, before output A is enabled.
Output A and LED A are immediately switched off by disabling the maximum high lift. The speed limitation will, however, be released only after a time lag that can be set (parameter 152).

3 different modes of operation are possible and can be selected with a parameter:

High lift for walking foot operational mode stored (parameter 138 = 1).
When actuating the A key or a knee switch, output A is enabled and is disabled when pressing it for the second time.

High lift for walking foot operational mode not stored (parameter 138 = 0, parameter 254 = 0).
While actuating the A key or a knee switch, output A is enabled.

High lift for walking foot operational mode not stored with minimum number of stitches (parameter 138 = 0, parameter 254 > 0).
When actuating the A key or a knee switch, output A is enabled and remains On until the set number of stitches (parameter 254) has been completed.

- When pressing the A key at drive standstill, high lift for walking foot is enabled and remains On after the start of sewing, at least for the set number of stitches.
- The ON period can be prolonged if the key is pressed down until after the end of stitch counting.
- If the key is pressed during counting, counting is reset.

The following function can be set using **parameter 262** if parameter 250 is et at “11“ and 255 at “5“ or parameter 250 at “5“ and 255 at “11“.
262 = 0 The roller remains lowered when enabling high lift for walking foot.
262 = 1 The roller is lifted when enabling high lift for walking foot.

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

Function **with** control panel		Parameter
High lift for walking foot operational mode stored = 1 / not stored = 0	(-F-)	**008 = 3**

8.14.10 Sewing Foot Pressure Reduction (Function Module A)

Function **with** or **without** control panel		Parameter
Sewing foot pressure reduction by external switch at output A	(FmA)	**250 = 12**
Switching full power or holding power of sewing foot lift	(FLd)	**332**
Full power if sewing foot lift is stored	(t4_)	**333**
Holding power if sewing foot lift is stored	(t5_)	**334**

After setting parameter 250 = 12, sewing foot pressure reduction can be enabled by pressing the external key at input A (socket A/8). If sewing foot lift is stored, full power and holding power are effective according to the setting of parameter 332 and the following pedal positions.

- Pedal position **0** Holding power according to setting of parameter **334**
- Pedal position **>1** Holding power according to setting of parameter **334**
- Pedal position **+1** Sewing foot is lowered
- Pedal position **-1** Holding power according to setting of parameter **204**
- Pedal position **-2** Holding power according to setting of parameter **204**

- **Parameter 332 = 0** The settings of parameters 203 and 204 determine the sewing foot lift function.
- **Parameter 332 = 1** If sewing foot lifting is stored in the seam, the solenoid will be fully activated based on the settings of parameter 333, and pulsed based on the settings of parameter 334.

8.14.11 Handwheel Runs in the Direction of Rotation (Function Module A)

Function **with** or **without** control panel		Parameter
Handwheel runs in the direction of rotation using the external switch at input A	(FmA)	**250 = 13**
Handwheel increments	(ihr)	**263**
Handwheel speed	(nhr)	**264**
Delay time until the key is pressed down causing the handwheel to rotate continuously	(dhr)	**265**
Sewing foot lift function during handwheel rotation	(LFL)	**266**

After setting parameter 250 = 13, the handwheel can be made to rotate according to the setting of parameter 161 by pressing the external key at input A (socket A/8). The number of increments for handwheel rotation after briefly pressing the key can be selected using parameter 263. The speed of handwheel rotation can be selected using parameter 264. A delay time is set using parameter 265. If the key is pressed briefly, i.e. for less than the set time, the increments set using parameter 263 are carried out. If the key is kept pressed down for more than the set delay time, the handwheel rotates continuously.

The sewing foot function can be set using **parameter 266**.

266 = 0 When pressing the key, the sewing foot lowers during handwheel rotation.

266 = 1 The sewing foot remains lifted during handwheel rotation, if the pedal is pressed to pos. –1 or automatic sewing foot lifting has been set.

When using a control panel, the functions can be assigned to the F1 and F2 keys using **parameters 293 and 294**.

293/294 = 8 Press key F1/F2 for the handwheel to run in the direction of rotation

293/294 = 9 Press key F1/F2 for the handwheel to run in the opposite direction of rotation

8.14.12 Handwheel Runs in the Opposite Direction of Rotation (Function Module A)

Function **with** or **without** control panel		Parameter
Handwheel runs in the opposite direction of rotation by external switch at input A	(FmA)	**250 = 14**

After setting parameter 250 = 14, the handwheel runs in the opposite direction of rotation. All other parameters fulfill the same functions as with setting “13“.

8.14.13 Backtack Suppression / Recall (Function Module A)

Function **with** or **without** control panel		Parameter
Backtack suppression/recall	(FmA)	**250 = 15**

The next backtack operation can be suppressed or recalled once by pressing the external key. This is acknowledged by the light emitting diode.

See also chapter “Backtack Suppression/Recall”.

8.14.14 Single Stitch Backwards with Stitch Length Switching (Function Module A)

Function **with** or **without** control panel		Parameter
Single stitch backwards with stitch length switching	(FmA)	**250 = 16**

After the start of sewing at intermediate stop, Output A, LED A and the backtacking solenoid will be switched on by pressing a key. The drive starts and positions itself in needle position 1.

8.14.15 Speed Limitation DB2000 (Function Module A)

Function **with** or **without** control panel		Parameter
Speed limitation DB2000	(FmA)	**250 = 17**

When input A is enabled, the drive runs at limited speed n10 (parameter 117).

8.15 Function Modules for Outputs B and C

The functions for the modules A/B/C are identical. For the functions of the mode selected using parameter 250 (A), 255 (B) or 275 (C), see description module A.
If in module B or C the same mode is set as in module A, the module A settings have priority.
For the assignment to the modules of the inputs and outputs used, see table in chapter “Function Modules for Outputs A/B/C”.

Assignment of parameter numbers to function modules					
Module A		Module B		Module C	
250	(FmA)	255	(FmB)	275	(FmC)
251	(AFA)	256	(AFB)	276	(AFC)
252	(Ain)	257	(Bin)	277	(Cin)
253	(cA)	258	(cB)	278	(cC)
254	(cA_)	259	(cB_)	279	(cC_)
In mode 11 parameter 184 is effective instead of 254/259/279					

8.16 Speed Limitation

8.16.1 Speed Limitation DB2000/DB3000

Function **with** or **without** control panel		Parameter
High lift walking speed (DB2000) Speed limitation (DB3000)	(n10) (n11)	**117** **289**

The speed is limited to 2000 RPM or 3000 RPM using the control inputs on A/9 (DB2000) and A/10 (DB3000). The speed limitations can be varied using parameters 117 and 289. When changing the switching state of the control inputs, the respective speed limitation is delayed by approx. 50 ms or is released.

Note
If several speed limitations are activated at the same time, the maximum speed is limited to the lower value.

8.16.2 Analog Speed Limitation

The maximum speed can be limited by an analog voltage on input A/3. The analog voltage is generated by a potentiometer which functions as voltage divider. If no potentiometer is connected, the maximum voltage is applied to the input. A potentiometer for speed limitation on the control is also possible.

8.16.3 Analog Speed Limitation Speedomat

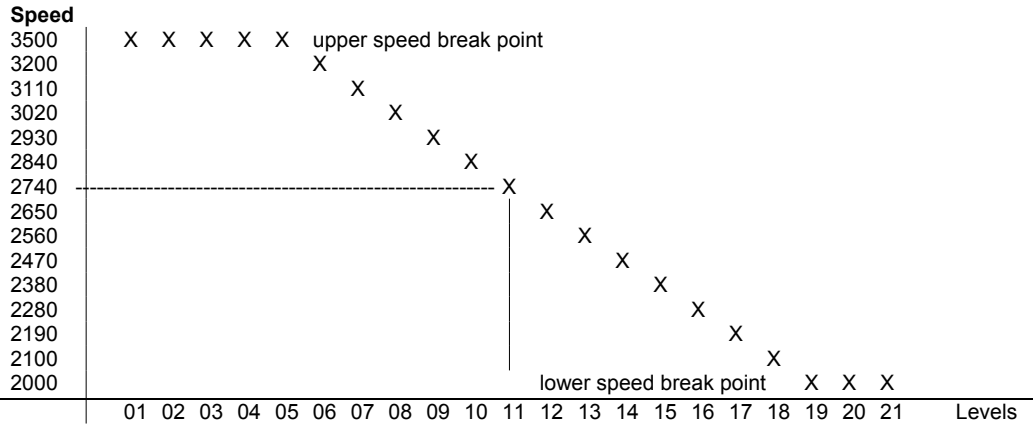
The speedomat function enables a speed limitation depending on the set sewing foot high lift (21 levels). The actual value of the high lift is transmitted to the control by the position of a potentiometer (10kΩ) with an angle of rotation of 60°, which is coupled with the high lift shaft.
The maximum angle of rotation of the high lift shaft is 48°. Thus the setting range of the potentiometer is from 9kΩ (nmax = 4.5V on socket A/3) to 1kΩ (nlim. = 0.5V on socket A/3).

Potentiometer connections see chapter **"Connection Diagram".**

Function **with** or **without** control panel		Parameter
Maximum speed	(n2)	**111**
High lift walking speed	(n10)	**117**
Speed setting depending on high lift	(hP)	**188**

- It is possible to program the assignment of the speed limitation to the 21 high lift levels.
- Minimum high lift = maximum speed (n2)
- Maximum high lift = minimum speed (n10)

Graduation of the example below is as follows:



Display example of parameter 188 on the V820/V850 control panel: ➔ **ZZZZ XX AB YY**

Signification:
XX ➔ Display of the level up to which the maximum speed is effective (upper break point).
YY ➔ Display of the level from which the maximum speed is effective (lower break point).
AB ➔ Display of the level set on the potentiometer.
ZZZZ ➔ Speed resulting from the set high lift level.
EEEE ➔ Outside of the speed range.

8.16.4 Setting the Speed Limitation Depending on High Lift with the V820 Control Panel

- Determine maximum speed (n2) using parameter 111.
- Determine minimum speed (n10) using parameter 117.
- Call parameter 188.
- **E** Press the **E** key. ➔ **F–188 hP [°]**
- **F2** Press the **F2** key. ➔ ZZZZ XX AB YY
- Set high lift for walking foot (potentiometer on the machine) to the level up to which full speed is to be maintained (upper break point).
- **E** New value of **AB** is taken over to **XX**. ➔ ZZZZ **XX** AB YY

- Set high lift for walking foot (potentiometer on the machine) to the level from which minimum speed is to be effective (lower break point).
- **E** New value of **AB** is taken over to **YY**. ➔ ZZZZ XX AB **YY**
- Press the **P** key once ➔ Actual parameter is displayed. / Press the **P** key twice ➔ Exit programming.

8.16.5 Setting the Speed Limitation Depending on High Lift with the V810 Control Panel

- Call parameter 188.
- **E** Press the **E** key. ➔ **hP [°]**
- **F2** Press the **F2** key. Actual display. ➔ **11. 3200**
- **F2** Press the **F2** key. Previous values are displayed. ➔ **05 19**
- **F2** Press the **F2** key. ➔ **11. 3200**
- Set new value (level) with potentiometer on the machine. ➔ **08. 3200**
- **F2** Press the **F2** key. ➔ **05 19**
- **E** Press the **E** key. New value 08 (upper break point) is entered. ➔ **08 08**
- **F2** Press the **F2** key. ➔ **08. 3200**
- Set new value (level) with potentiometer on the machine. ➔ **17. 3200**
- **F2** Press the **F2** key. ➔ **08 08**
- **E** Press the **E** key. New value 17 (lower break point) is entered. ➔ **08 17**
- **P** Press the **P** key once. Display of the actual parameter number. ➔ **F - 188**

or

- **P** **P** Press the **P** key twice. Exit programming. ➔ **dA321G**

These values are saved when you start sewing. They remain in effect even after turning the machine off!

Note

If you set a value on the potentiometer, which is between the actual break points, both values will be overwritten when pressing the **E** key. Only after that is it possible to program new lower and/or upper break point values.

8.17 Thread Trimming Operation

Function **with** or **without** control panel		Parameter
Thread trimmer On/Off	(FA)	**013**
Thread wiper On/Off	(FW)	**014**

Function **with** control panel		V820
Thread trimmer On	lefthand arrow On	Key 5
Thread wiper On	righthand arrow On	
Thread trimmer and thread wiper On	both arrows On	
Thread trimmer and thread wiper Off	both arrows Off	

When a V820/V850 control panel is connected, the functions can also be switched on and off using key **5**.

Function **with** or **without** control panel		Parameter
Trimming stitch backward	(FAr)	**136**
Thread trimmer activation angle	(iFA)	**190**
Thread tension release switch-off delay	(FSA)	**191**
Thread tension release switch-on delay angle	(FSE)	**192**
Tread trimmer stop time	(tFA)	**193**
Thread trimmer switch-on delay angle	(FAE)	**194**
Thread wiper time	(t6)	**205**
Delay after thread wiping until sewing foot lifting	(t7)	**206**

The thread trimming operation is initiated by full heelback or automatically at the end of a counted seam section or automatically by light barrier sensing after the light barrier compensating stitches. If the "trimming stitch backward" function is On (parameter 136 = 1), the backtack solenoid in the single or triple end backtack remains On until stop in position 2. When the thread trimmer is Off, the drive stops in the reversing position when reaching the seam end.

8.17.1 Trimming Speed

Function **with** or **without** control panel		Parameter
Trimming speed	(n7)	**116**

8.17.2 Thread Trimmer

The thread trimming signal is enabled when reaching the trimming speed with leading position 1 and is disabled after completion of the angle which can be adjusted (parameter 190), or at the very latest with the stop in position 2. A stop time for the thread trimmer, during which the drive is at standstill after reaching position 1, can be set with parameter 193. If position 2 is not reached due to a mechanical defect, the thread trimming signal is disabled after 10 sec. This way, the solenoid with 25% duty ratio will be protected against damage.

8.17.3 Thread Tension Release

The thread tension release signal can be enabled with a time lag relative to the thread trimmer. The time lag is an angular value that is inputted in parameter 192. The signal is disabled in position 2. It can, however, be extended for a time that can be regulated with parameter 191.
If position 2 is not reached due to a mechanical defect, the output is disabled after 10 sec. This way, the solenoid with 10% duty ratio will be protected against damage.

8.17.4 Thread Wiper

The thread wiper signal is enabled for a time that can be regulated with parameter 205 after reaching position 2. After the thread wiper has been disabled, there will be a time lag that can be regulated with 206 until the sewing foot can be lifted.
If the thread wiper is Off, the time lag phase for the sewing foot lift (parameter 206) will not occur.

8.17.5 Thread Clamp and Sewing Foot Pressure Reduction

Functions		Parameter
Thread clamp functions	(FkL)	**154**
Thread clamp switch-on angle (signal 1)	(k1)	**155**
Thread clamp switch-off angle (signal 1)	(k1-)	**156**
Thread clamp switch-on angle (signal 2)	(k2)	**157**
Thread clamp switch-off angle (signal 2)	(k2-)	**158**
Angle until sewing foot lift is switched on	(NF)	**159**
Angle until sewing foot lift is switched off	(NF_)	**160**
Sewing foot pulsing 1…100 %	(t5_)	**334**

The functions of the thread clamp feature can be selected using parameter 154. Directly after power On, the thread clamp signal is disabled.
The thread clamp signal is issued:
- when the sewing foot is lifted
- during reversion
- after the start of the drive

The following settings are possible using **parameter 154**:
154 = 0 Thread clamp Off.
154 = 1 **Thread clamp function**: Using the values of parameters 155...158. The thread clamp (signal 1) is enabled after execution of the angle preset with the use of parameter 155 and is disabled after execution of the angle preset with the use of parameter 156. If parameters 157 and 158 >0, the thread clamp (signal 2) is again enabled and disabled.
Sewing foot pressure function: Sewing foot lifting is enabled and pulsed after execution of the angle preset with the use of arameter 159 (parameter 334) and is disabled after execution of the angle set with the use of parameter 160.
154 = 2...7 The thread clamp function is performed with a preset angle.

If parameter 154 >0, the speed is limited to 250 RPM.
The angle setting always refers to the reference point set with the use of parameter 170.

8.18 Seam with Stitch Counting

Function **without** control panel		Parameter
Stitch counting On/Off	(StS)	**015**

Function **with** control panel		V820/V850
Stitch counting forward On	left-hand arrow On	Key 2
Stitch counting backward On	right-hand arrow On	
Stitch counting Off	both arrows Off	

8.18.1 Stitches for Stitch Counting

Function **with** or **without** control panel		Parameter
Number of stitches for a seam with stitch counting	(Stc)	**007**

The stitch counting stitches can be programmed and varied using the above parameters directly on the control or on a connected V810/V820/V850 control panel.
For fast operator information (HIT) when using the V820/V850 control panel, the value of the function switched on by means of key **2** can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

8.18.2 Stitch Counting Speed

Function **with** or **without** control panel		Parameter
Stitch counting speed	(n12)	**118**
Speed mode for a seam with stitch counting	(SGn)	**141**

Speed control for stitch counting can be selected using **parameter 141**.

141 = 0 Execution at pedal controlled speed.
141 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1).
141 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1).
141 = 3 Automatic execution at fixed speed after having pressed the pedal once.
The procedure can be interrupted by “heelback (-2)".
141 = 4 Automatic execution at fixed speed after having pressed the pedal once.
The procedure can be interrupted by “heelback (-2)".

The sewing speed is reduced in each stitch depending on the actual speed (max. 11 stitches before the end of stitch counting), in order to be able to stop exactly at the end of counting. When the light barrier is on, free sewing will be performed after stitch counting.

8.18.3 Seam with Stitch Counting When Light Barrier Is On

Function **with** or **without** control panel		Parameter
Light barrier On/Off	(LS)	**009**
Stitch counting On/Off	(StS)	**015**

Function **with** control panel	V820/V850
Light barrier On/Off	Key 3
Stitch counting On/Off	Key 2

When "stitch counting and light barrier function " is set, the number of stitches will be executed first, then the light barrier will be activated.

8.19 Free Seam and Seam with Light Barrier

Function **with** or **without** control panel		Parameter
Positioning speed	(n1)	**110**
Upper limit of maximum speed	(n2)	**111**
Limited speed according to setting of 142	(n12)	**118**
Lower limit of maximum speed	(n2_)	**121**
Speed mode free seam	(SFn)	**142**

Through the use of **parameter 142** the speed control for the free seam and the seam with stitch counting can be selected using the speed mode.

142 = 0 Execution at pedal controlled speed
142 = 1 Execution at fixed speed n12, when pressing the pedal forward (position >1)
142 = 2 Execution at limited speed n12, when pressing the pedal forward (position >1)
141 = 3 Only for the seam with light barrier:
- Automatic execution at fixed speed after having pressed the pedal once.
- The seam end is initiated by light barrier.
- The procedure can be interrupted by heelback (-2).
- If the light barrier is not on, speed as with parameter setting 142 = 0.

When using a control panel, the maximum speed is displayed after power on and thread trimming and can be varied directly by means of key +/- on the control panel. The setting range lies between the values of parameters 111 and 121.

8.20 Light Barrier

- Light barrier module LSM002 is provided and is connected to socket B18.
- Moreover, an external light barrier can be connected to socket A/13.
- Both light barrier inputs initiate the same function and can be enabled and disabled with the same parameters.

Function **with** or **without** control panel	Parameter
Light barrier On/Off	009

Function **with** control panel		V820/V850
Light barrier covered/uncovered On Light barrier uncovered/covered On Light barrier Off	right-hand arrow On left-hand arrow On both arrows Off	Key 3

8.20.1 Speed after Light Barrier Sensing

Function **with** or **without** control panel		Parameter
Speed after light barrier sensing	(n5)	**114**

8.20.2 General Light Barrier Functions

Function **with** or **without** control panel		Parameter
Light barrier compensating stitches (for long stitches)	(LS)	**004**
Number of light barrier seams	(LSn)	**006**
Light barrier compensating stitches (for normal stitches)	(cLS)	**010**
Light barrier sensing uncovered/covered	(LSd)	**131**
Start of sewing blocked/unblocked with light barrier uncovered	(LSS)	**132**
Light barrier seam end with thread trimming On/Off	(LSE)	**133**

- After sensing the seam end, the compensating stitches are counted at light barrier speed.
- Suspension of the procedure with pedal in pos. 0 (neutral). Interruption of the procedure with pedal in pos. -2.
- The thread trimming operation can be disabled using parameter 133, regardless of the setting of key **5** on the V820/V850 control panel. Stop in the basic position.
- Programming of max. 15 light barrier seams depending on the setting of parameter 006 with stop in the basic position. Thread trimming after the last light barrier seam.
- Light barrier sensing uncovered or covered at the seam end can be selected using parameter 131.
- Start blockage with light barrier uncovered programmable using parameter 132.

The light barrier compensating stitches can be programmed and varied using the above parameters directly on the control or on a connected control panel. For fast operator information (HIT) when using the V820/V850 control panel, the value of the function switched on by means of key **3** can be displayed for approx. 3 seconds. During this time, the value can be varied directly by pressing key + or -.

8.20.3 Reflection Light Barrier LSM002

Sensitivity setting:
Set minimum sensitivity depending on the distance between light barrier and reflection area (turn potentiometer as far as possible to the left).

- Potentiometer directly on the light barrier module

Mechanical orientation:
Orientation is facilitated by a visible light spot on the reflection area.

8.20.4 Automatic Start Controlled by Light Barrier

Function **with** or **without** control panel		Parameter
Delay of automatic start	(ASd)	**128**
Automatic start On/Off	(ALS)	**129**
Light barrier sensing uncovered	(LSd)	**131**
Start of sewing blocked with light barrier uncovered	(LSS)	**132**

This function enables an automatic start of the sewing operation as soon as the light barrier senses the insertion of fabric.

Prerequisites for the operation:
- Parameter 009 = 1 (light barrier On).
- Parameter 129 = 1 (automatic start On).
- Parameter 131 = 1 (light barrier sensing uncovered).
- Parameter 132 = 1 (no start of sewing with light barrier uncovered).
- The pedal must be kept pressed forward at the seam end.

For safety reasons this function is enabled only after a normal start of sewing. The light barrier must be covered as long as the pedal is in position 0 (neutral). Then press the pedal forward. This function is disabled when the pedal is no longer pressed forward after the seam end.

8.20.5 Light Barrier Filter for Knitted Fabrics

Function **with** or **without** control panel		Parameter
Number of stitches of the light barrier filter	(LSF)	**005**
Light barrier filter On/Off	(LSF)	**130**
Light barrier sensing uncovered or covered	(LSd)	**131**

The filter prevents premature enabling of the light barrier function when sewing knitted fabrics.
- Enabling/Disabling of the filter using parameter 130
- The filter is not active if parameter 005 = 0
- Adaptation to the mesh is possible by varying the number of filter stitches.
- Knitted fabric sensing with light barrier uncovered ➔ covered, if parameter 131 = 0
  Knitted fabric sensing with light barrier covered ➔ uncovered, of parameter 131 = 1

8.21 Switching Functions of Inputs in1, in3, in5, in6, in8, in9 and i10

Function **with** or **without** control panel	Parameter
Selection of the input function	**241...249**

The functions of the keys/switches connected to socket connectors ST2 and B4 can be selected for the inputs in2, in3, in5, in6, in8, in9 and i10 using parameters 241, 242, 244, 245, 247, 248 and 249.

Parameters 241, 242, 244, 245, 247, 248, 249 =:

0 Input function blocked

1 Needle up/down:
Upon pressing the key, the drive runs from position 1 to the reversing position, no matter if reversion is enabled or disabled. If parameter 180 is set to 0, the drive stops in position 2. If the drive is outside of the slot of position 1, no movement will be performed for safety reasons. After power On, the function will be disabled until you have started sewing.

2 Needle up:
Upon pressing the key, the drive runs from position 1 to the reversing position, no matter if reversion is enabled or disabled. If parameter 180 is set to 0, the drive stops in position 2. If the drive is outside of the slot of position 1, no movement will be performed for safety reasons. After power On, the function will be disabled until you have started sewing.

3 Single stitch (basting stitch):
Upon pressing the key, the drive performs one rotation from position 1 to position 1. If the drive is in the reversing position, it runs to position 1 upon pressing the key and from position 1 to position 1 each time the key is pressed again.

4 **Full stitch:**
Upon pressing the key, the drive performs a full rotation depending on the set stop position.

5 **Needle to position 2:**
Upon pressing the key, the drive runs to position 2 or to the reversing position, regardless of its previous position.

6 **Machine run blockage effective with open contact:**
Upon opening the switch, the drive stops in the pre-selected basic position.

7 **Machine run blockage effective with closed contact:**
Upon closing the switch, the drive stops in the pre-selected basic position.

8 **Machine run blockage effective with open contact (unpositioned):**
Upon opening the switch, the drive stops immediately without positioning.

9 **Machine run blockage effective with closed contact (unpositioned):**
Upon closing the switch, the drive stops immediately without positioning.

10 **Run at automatic speed (n12):**
Upon pressing the key, the drive runs at automatic speed. The pedal is not used.

11 **Run at limited speed (n12):**
Upon pressing the key, the drive runs at limited speed. The pedal must be pressed forward.

12 **Sewing foot lifting with pedal in position 0 (neutral)**

13 **High lift for walking foot operational mode not stored:**
The signal “high lift for walking foot” is issued as long as the key is held down, and the drive runs with speed limitation (n10).

14 **High lift for walking foot operational mode stored:**
The signal “high lift for walking foot” is issued upon briefly pressing the key, and the drive runs with speed limitation (n10). The operation is disabled upon pressing the key again.

15 **Sewing foot pressure**

16 **Intermediate backtack / Intermediate stitch condensing:**
Upon pressing the key, the backtack or stitch condensing will be enabled anywhere in the seam and at standstill of the drive.

17 **Stitch regulator suppression / recall:**
Upon pressing the key, the backtack or stitch condensing operation will be suppressed or recalled once.

18 **Reduction of thread tension release**

19 **Reset bobbin thread monitor:**
After inserting a full bobbin, the stitch counter is set to the preset value (parameter 195 = 4).

20 **Handwheel running in the direction of rotation:**
Upon pressing the key, the drive runs (parameter 161 = 0).

21 **Handwheel running in the direction of rotation:**
Upon pressing the key, the drive runs in the opposite direction of rotation (parameter 161).

22 **Switch stitch length**

23 **Roller**

24 **No function**

25 **DB2000:**
Upon pressing the key, the drive runs at fixed speed n10 (DB2000).

26 **Input speed limitation n11 (DB3000)**

27 **Input speed limitation n10 (DB2000)**

28 **External light barrier:**
In this mode it is possible to initiate the seam end using a key, not the light barrier. But the light barrier function must be On.

29 **Single stitch with stitch length switching**.

30 **Emergency stop:**
After pressing the key, the drive stops in position 2, and the sewing foot is lifted. The symbol “machine run blockage” flashes on the V820/V850, or “stop” flashes on the V810. The drive functions are disabled. Only after power Off/On, the drive will again be ready for operation.

31…38 **No function**

39 **Switch to the next pattern in TEACH IN:**
Upon pressing the key, the program switches to the next pattern.

40 **Switch back to the previous pattern TEACH IN:**
Upon pressing the key, the program switches to the previous pattern.

41…45 **No function**

46 **Key for function module A**

47 **Key for function module B**

48 **Signal A1 is issued:**
Upon pressing the key, signal A1 is issued immediately.

49 **Signal A1 switchable as flip-flop:**
Upon pressing the key, signal A1 is activated and deactivated when pressing the key again.

50 **No function**

51 **Signal A2 is issued:**
Upon pressing the key, signal A2 is issued immediately.
52 **Signal A2 switchable as flip-flop:**
Upon pressing the key, signal A2 is activated and deactivated when pressing the key again.
53…77 **No function**
78 **Switch function "high lift for walking foot" operational mode stored/not stored**
79…88 **No function**

8.22 F1/F2 Function Key Assignment on the V810/V820/V850 Control Panels

Functions		Parameter
Selection of input function on key (A) "F1" on the V810/V820/V850 control panels	(tF1)	**293**
Selection of input function on key (B) "F2" on the V810/V820/V850 control panels	(tF2)	**294**

The following functions are possible using **parameters 293 and 294**:

293/294 = 0 **Input function blocked**
293/294 = 1 **Needle up/down:** Upon pressing the key, the drive runs from position 1 to the reversing position, no matter if reversion is enabled or disabled. If parameter 180 is set to 0, the drive stops in position 2. If the drive is outside of the slot of position 1, no movement will be performed for safety reasons. After power On, the function will be disabled until you have started sewing.
293/294 = 2 **Needle up:** Upon pressing the key, the drive runs from position 1 to the reversing position, no matter if reversion is enabled or disabled. If parameter 180 is set to 0, the drive stops in position 2. If the drive is outside of the slot of position 1, no movement will be performed for safety reasons. After power On, the function will be disabled until you have started sewing.
293/294 = 3 **Single stitch (basting stitch):** Upon pressing the key, the drive performs one rotation from position 1 to position 1. If the drive is in position 2, it runs to position 1 upon pressing the key and from position 1 to position 1 each time the key is pressed again.
293/294 = 4 **Full stitch:** Upon pressing the key, the drive performs a full rotation depending on the stop position.
293/294 = 5 **Needle to position 2:** Upon pressing the key, the drive runs to position 2 or to the reversing position, regardless of its previous position.
293/294 = 6 **Output A if parameter 250 <0**
293/294 = 7 **Output B if parameter 250 <0**
293/294 = 8 **Handwheel runs in the direction of rotation**
293/294 = 9 **Handwheel runs in the opposite direction of rotation**
293/294 = 10...12 **No function**
293/294 = 13 **High lift for walking foot operational mode not stored:** The signal "high lift for walking foot" is issued as long as the key is pressed down, and the drive runs with speed limitation (n10).
293/294 = 14 **High lift for walking foot operational mode stored /flip-flop 1:** The signal "high lift for walking foot" is issued upon briefly pressing the key, and the drive runs with speed limitation (n10). The operation is disabled upon pressing the key again.
293/294 = 15 **No function**
293/294 = 16 **Intermediate backtack:** Upon pressing the key, the backtack will be enabled anywhere in the seam and at standstill of the drive.
293/294 = 17 **Backtack suppression / recall:** Upon pressing the key, the backtack will be suppressed or recalled once.
293/294 = 18 **No function**
293/294 = 19 **Reset bobbin thread monitor:** After inserting a full bobbin, the stitch counter is set to the preset value (if pa. 195 = 4).

8.23 Signals A1 and A2

When using the V820/V850 control panel, direct access by means of the function key (key 9) is possible!

Function **with** control panel		Parameter
Signal A1 and/or A2 On/Off with slide-in strip 1...4 (left-hand arrow = A1, right-hand arrow = A2)	(-F-)	**008 = 5**

Function **with** control panel		V820/V850
Signal A1 On	left-hand arrow above key On	Key 8
Signal A2 On	right-hand arrow above key On	
Signals A1 and A2 On	both arrows above key On	
Signals A1 and A2 Off	both arrows above key Off	

Parameters 300-309, 330, 331 for A1 and 310-319, 335, 336 for A2 determine when and how long the **signals** are enabled or disabled, or other conditions take effect.
When a V820 control panel is used, signals A1/A2 can be assigned to a seam using key **8** (slide-in strips 6, 8, 9 and 10).

Using parameter **300/310**, it is possible to set which output (M1-M11 or VR) can be switched by A1/A2.

Using parameter **301/311**, it is possible to select if signal A1/A2 is effective until the seam end, stop at the seam end, over time or during stitch counting.

301/311
- **0** until seam end (parameter **320**)
- **1** over time (parameter **304/305/314/315**)
- **2** until stop at the seam end
- **3** during stitch counting (parameter **308/309/318/319**)
- **4** puller function

Using parameter **302/312**, it is possible to select if the signal A1/A2 shall be effective at the start of the seam, after light barrier sensing or at the seam end.

302/312
- **0** Signal at the beginning of the seam
- **1** Signal after light barrier sensing
- **2** Signal at stop of the drive at the seam end
- **3** Signal from light barrier covered at the start of the seam
- **4** Signal only manually switchable

Using parameter **303/313**, it is possible to select if the signals shall be activated with or without delay.

303/313
- **0** without delay time
- **1** after a delay time (parameter **308/318**)
- **2** after a stitch count (parameter **309/319**)

The delay time can be selected using parameter **304/314**.

The ON period can be selected using parameter **305/315**.

The speed mode can be set using parameter **306/316**. The speed limitation is effective only when the signal is On.

306/316
- **0** Pedal controlled speed
- **1** Limitation to speed n9 (parameter **288**)
- **2** Limitation to speed n11 (parameter **289**)

The function for A1/A2 can be enabled or disabled separately using parameter **307/317**.

Using parameter **308/318**, it is possible to select if the signals shall be activated with or without delay stitch count.

308/318
- **0** without delay stitches
- **1** with delay stitches

Separate stitch counts can be selected using parameter **309/319**.

The switch-off moment can be set using **parameter 320**.

320
- **0** signals effective until seam end
- **1** signals effective until pedal has been pressed to pos. 0 (neutral)

Using parameter **330** for signal A1 and parameter **335** for signal A2, it is possible to select if these signals and sewing foot lifting shall be coupled or these signals and backtacking shall be coupled.

330/335
- **0** coupling off
- **1** coupling with sewing foot lifting
- **2** coupling with backtacking
- **3** coupling with sewing foot lifting and backtacking

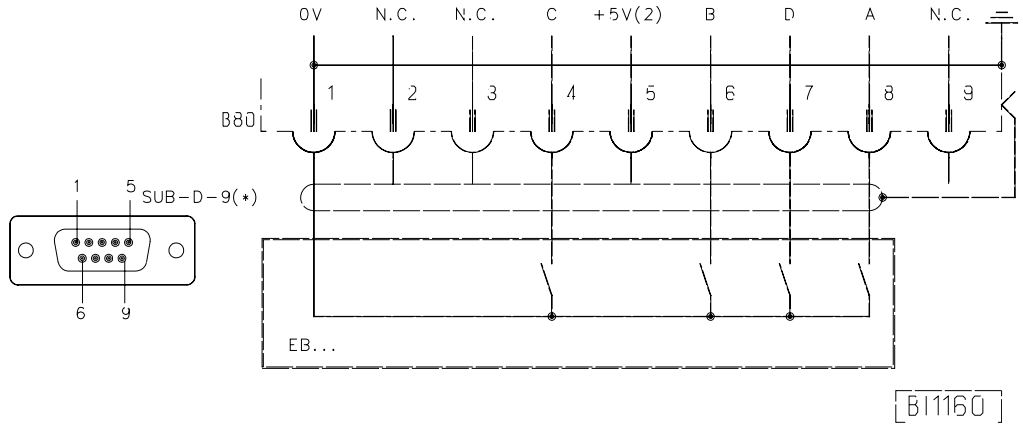
Signals A1/A2 can be inverted using parameter **331/336**.
Signals A1/A2 can be switched using the "**F**" key on the V820 control panel if parameter **008** is set accordingly.

8.24 Actuator

The commands for the sewing operation are input by means of the actuator, which is connected to the pedal. Instead of the built-on actuator another actuator can also be connected to socket B80.

Table: Coding of the Pedal Steps

Pedal step	D	C	B	A		
-2	H	H	L	L	Full heelback	(e. g. initiating the seam end)
-1	H	H	H	L	Slight heelback	(e. g. sewing foot lifting)
0	H	H	H	H	Pedal in pos. 0 (neutral)	
½	H	H	L	H	Pedal slightly forward	(e. g. sewing foot lowering)
1	H	L	L	H	Speed stage 1	(n1)
2	H	L	L	L	Speed stage 2	
3	H	L	H	L	Speed stage 3	
4	H	L	H	H	Speed stage 4	
5	L	L	H	H	Speed stage 5	
6	L	L	H	L	Speed stage 6	
7	L	L	L	L	Speed stage 7	
8	L	L	L	H	Speed stage 8	
9	L	H	L	H	Speed stage 9	
10	L	H	L	L	Speed stage 10	
11	L	H	H	L	Speed stage 11	
12	L	H	H	H	Speed stage 12	(n2) Pedal fully forward



EB.. Actuator
2) Nominal voltage 5V, I_{max} = 20 mA

Function **with** or **without** control panel		Parameter
Speed stage graduation	(nSt)	**119**

The pedal characteristics (speed change from stage to stage) can be varied.
Possible characteristic curves:
- linear
- progressive
- highly progressive

8.25 Acoustic Signal

Function **with** control panel		Parameter
Acoustic signal On/Off	(AkS)	**127**

An acoustic signal which sounds in the following cases can be enabled using parameter 127:
- When the machine run blockage is On.

8.26 Master Reset

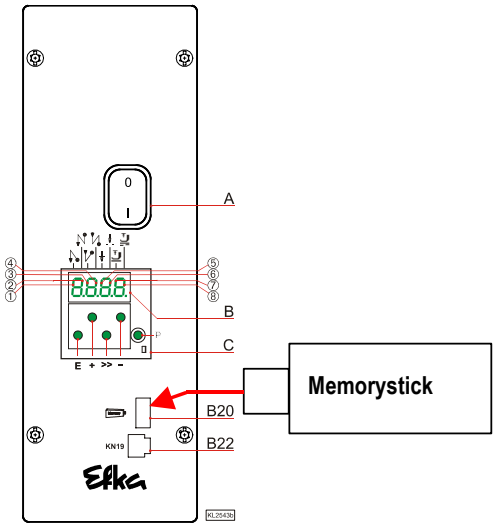
Recovery of factory settings.

- Press the "**P**" key and turn power on
- Input code number "**190**"
- Press the "**E**" key
- Parameter 100 appears on the display
- Press the "**E**" key
- The parameter value is shown on the display
- Set to "**170**" using the **"+"** key
- Press the "**P**" key twice
- Turn power off
- Turn power on. All parameters, except 111, 161, 170, 171, 190...193, have been reset to their factory settings.

9 Data Storage via USB Port

For easy storage of settings and programs a Memory Stick can be used. This way, sequences once established can be reused as desired and can be transferred to other function compatible EFKA controls.
Data can also be swapped out from Memory Stick to PC for storage expansion and/or convenient data management.

9.1 USB Port



A USB Memory Stick can be connected to port B20. The Stick can serve as a data memory for storing data from the control or loading data into it.
Data can also be transferred to and from a PC.
A direct connection between a PC and the control is not provided.

Any commercially available FAT formatted Memory Stick (USB 1.0 or 2.0) may be used, with the exception of the FAT32 format. The Memory Stick can be formatted on a PC.
Connect the Memory Stick to a PC:

- Open the File Explorer.
- Right click on Memory Stick symbol (or on the drive designation used on your PC).
- Left click on »Formatting«.
  Select the FAT file system, start formatting.

The following data can be transferred from and/or to the Efka control:

Parameters……..	Memory Stick ←→	Control
Seam Patterns……	Memory Stick ←→	Control
Array Data *……	Memory Stick ←→	Control
Compiler Program **……..	Memory Stick →	Control
Control Software ***……	Memory Stick ←→	Control

* Array data is compiler data.
** Compiler programs are copy-protected and can therefore not be read out from the control!
*** Control flash memory software can be programmed and/or read out via USB socket.

Data is filed on the Memory Stick. The maximum number of filename characters (letters or digits) is 8.

Example: XXXXXXXX.YYY
| |__ Y = Filename extension
|_____ X = Filename

XXXXXXXX.PAR…….. = Parameter file
XXXXXXXX.PAY…….. = ARRAY file
XXXXXXXX.PTI…… = Seam pattern file (Teach In)
XXXXXXXX.PRG…….. = Compiler file
XXXXXXXX.HEX……..= Control software file (FLASH)

For PC file management, short filenames should be used if possible (≤ 8 characters).
If a filename consists of more than 8 characters, it will be cut to 7 characters, and the character „ ~" is added on the display.

Example: **Maschine3547.PAR** will be displayed as **Maschin~.PAR**.

The control automatically specifies a filename for data copied from control to Memory Stick.
The first two digits specify the file type, digits 3+4 the file number.

File type
↓
0100DATA.PAR……..**01** = Parameter file
0200DATA.PTI……**02** = Seam pattern file
0300DATA.PAY……..**03** = Array file
0400DATA.HEX……..**04** = Control software file
↑
File number

The above representation is especially useful with control operation instead of Variocontrol operation, because it makes it easier to read file type and number on the 4-digit display.

If there is not yet a numbered file on the Memory Stick, the control automatically creates file number 00. If there is a numbered file on the Stick, the next higher number will be used.
Any other file number available on the Stick can also be selected using key + / -, but in this case the file number will be overwritten, and any previous file content is lost.
The control can manage a maximum of 99 Memory Stick files. When this max. number is exceeded, the error message »***A500*** = *Max. number of files (99) on MemoryStick exceeded*«.

On principle, filenames can be freely specified and/or overwritten on the PC, as long as the 3-digit filename extension is maintained. When downloading files into the control, complete filenames can be shown on the V850 display, whereas shorter filenames (digits, see above) are to be preferred if using the control display.

Important note:
The control does not identify files saved in folders. It can only identify files that are saved directly on the Memory Stick!

9.2 USB Parameters

The following parameters are available for reading out, storing, comparing or deleting data:

Parameter	Parameter Settings
510	Transfer from control to Memory Stick
511	Transfer from Memory Stick to control
512	Comparison between control and Memory Stick
513	Delete file from Memory Stick
	Array Data (Compiler Programming)
514	Transfer from control to Memory Stick
515	Transfer from Memory Stick to control
516	Comparison between control and Memory Stick
517	Delete file from Memory Stick
	Seam Pattern (Teach In)
518	Transfer from control to Memory Stick
519	Transfer from Memory Stick to control
520	Comparison between control and Memory Stick
521	Delete file from Memory Stick
	Compiler Program
523	Transfer from Memory Stick to control
	Control Software (Software Update / Flash Memory)
526	Transfer from control to Memory Stick
527	Transfer from Memory Stick to control
528	Comparison between control and Memory Stick
529	Delete file from Memory Stick

9.3 Storing Data on the Memory Stick

When connecting the Memory Stick to the control, the following message appears on the display:
Control: Usb
V810: USb On
V820: USb dEtEct
V850: USB DETECT

A code number does not have to be inputted; the control is automatically available for programming via Memory Stick. The parameter number may be inputted immediately.

Storing data (including parameters) on the Memory Stick will be explained in the following

9.3.1 Programming on the Control

P	Press the P key. The first PARAMETER number is displayed.	➔	.0.0.0.
	Select parameter 510.	➔	.5.1.0.
E	Press the E key. PUL_ is displayed.	➔	PUL_
>>	Press the shift key. File type and number are displayed.	➔	0 1 0 0
+ -	Press the plus / minus key to select an existing filename.		

or

E	Press the E key. Parameter data is written to the Memory Stick in file 0100DATA.PAR.	➔	W r i t
	At the end of the writing process, READY will be displayed.		R d Y

9.3.2 Programming on the V810

P	Press the P key. The first PARAMETER number is displayed.	➔	F – 0 0 0
	Select parameter 510.	➔	F – 5 1 0
E	Press the E key. A request for pressing the shift key is displayed.	➔	[°]
>>	Press the shift key. File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		

or

E	Press the E key. Parameter data is written to the Memory Stick in file 0100DATA.PAR.	➔	W r i t e
	At the end of the writing process, READY will be displayed.		R e a d Y

9.3.3 Programming on the V820

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 510.	➔	F 510
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 510 PUL [°]
F2	Press the F2 key. File type and number are displayed.	➔	0100 dAtA PAr
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. Parameter data is written to the Memory Stick in file 0100DATA.PAR.	➔	Writ E dAtA
	At the end of the writing process, READY will be displayed.	➔	rEAdY

9.3.4 Programming on the V850

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 510.	➔	F 510 Upload ..
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 510 0 F2
F2	Press the F2 key. File type and number are displayed.	➔	0100DATA.PAR
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. Parameter data is written to the Memory Stick in file 0100DATA.PAR.	➔	WRITE DATA
	At the end of the writing process, READY will be displayed.	➔	READY

9.4 Reading Data from the Memory Stick into the Control

Reading data into the control will be explained in the following.

9.4.1 Programming on the Control

P	Press the P key. The first PARAMETER number is displayed.	➔	.0.0.0.
	Select parameter 511.	➔	.5.1.1.
E	Press the E key. PdL_ is displayed.	➔	PdL_
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	A501
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		

or

E	Press the E key. A request for confirmation is displayed.	➔	PU-E
E	Press the E key within 1 second. File 0100 is read in.	➔	rEAd
	At the end of the writing process, READY will be displayed.	➔	R d Y

9.4.2 Programming on the V810

P	Press the P key. The first PARAMETER number is displayed.	➔	F – 0 0 0
	Select parameter 511.	➔	F – 5 1 1
E	Press the E key. A request for pressing the shift key is displayed.	➔	[°]
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	noFiLE
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		

or

E	Press the E key. A request for confirmation is displayed.	➔	PUSh-E
E	Confirm within 1 second using the E key. File 0100 is read in.	➔	rEAd
	At the end of the reading process, READY will be displayed	➔	rEAdY

9.4.3 Programming on the V820

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 511.	➔	F 511
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 511 PdL [°]
F2	Confirm using the F2 key. In case no file is found on the Memory Stick, there will be an error display.	➔	no FiLE
	or File type and number are displayed.	➔	0100 dAtA PAr
+ -	A different existing filename may be selected using the plus / minus key.		

or

E	Press the E key. A request for confirmation is displayed.	➔	rEAd PrESS E
E	Confirm within 1 second using the E key. File 0100 is read in.	➔	rEAd dAtA
	At the end of the reading process, READY will be displayed.	➔	rEAdY

9.4.4 Programming on the V850

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 511.	➔	F 511 Download p..
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 511 0 F2

F2	Press the F2 key. File type and number are displayed.	➔	0100DATA.PAR
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	READ PRESS E
E	Confirm within 1 second using the E key. File 0100 is read in.	➔	READ DATA
	At the end of the reading process, READY will be displayed.	➔	READY

9.5 Comparison of Memory Stick and Control Data

The comparison of control and Memory Stick data will be explained in the following. The procedure applies to any kind of data.

9.5.1 Programming on the Control

P	Press the P key. The first PARAMETER number is displayed.	➔	. 0.0.0.
	Select parameter 512.	➔	. 5.1.2.
E	Press the E key. PcP_ is displayed.	➔	PcP_
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	A501
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	PU-E
E	Confirm within 1 second using the E key. File 0100 is read in.	➔	rEAd
	At the end of the reading process, if the data is equal, READY will be displayed.	➔	R d Y
	At the end of the reading process, if the data is <u>not</u> equal, A503 will be displayed.	➔	A503

9.5.2 Programming on the V810

P	Press the P key. The first PARAMETER number is displayed.	➔	F – 0 0 0
	Select parameter 512.	➔	F – 5 1 2
E	Press the E key. A request for pressing the shift key is displayed.	➔	[°]
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	noFiLE
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	PUSh-E
E	Confirm within 1 second using the E key. File 0100 is compared to control data.	➔	rEAd
	At the end of the reading process, if the data is equal, READY will be displayed.	➔	rEAdY
	At the end of the reading process, if the data is <u>not</u> equal, NOT EQ will be displayed.	➔	Not EQ

9.5.3 Programming on the V820

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 512.	➔	F 512
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 512 PcP [°]
F2	Press the F2 key. In case no file is found on the Memory Stick, there will be an error display.	➔	no FiLE
	or File type and number are displayed.	➔	0100 dAtA PAr

+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	cMP PrESS E
E	Confirm within 1 second using the E key. File 0100 is compared to control data.	➔	rEAd dAtA
	At the end of the reading process, if the data is equal, READY will be displayed.	➔	rEAdY
	At the end of the reading process, if the data is <u>not</u> equal, “Not Equal” will be displayed.	➔	not EQUAL

9.5.4 Programming on the V850

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 512.	➔	F 512 Compare p…
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 512 0 F2
F2	Press the F2 key. File type and number are displayed.	➔	0100DATA.PAR
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	COMPARE PRESS E
E	Confirm within 1 second using the E key. File 0100 is compared to control data.	➔	READ DATA
	At the end of the reading process, if the data is equal, READY will be displayed.	➔	READY
	At the end of the reading process, if the data is <u>not</u> equal, “Data Not Equal” will be displayed.	➔	DATA NOT EQUAL

9.6 Data Deletion from Memory Stick

Data deletion (including parameter data) from Memory Stick is explained in the following.

9.6.1 Programming on the Control

P	Press the P key. The first PARAMETER number is displayed.	➔	. 0.0.0.
	Select parameter 513.	➔	. 5.1.3.
E	Press the E key. PdE_ is displayed.	➔	PdE_
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	A501
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	PU-E
E	Confirm within 1 second using the E key. At the end of the deletion process, READY will be displayed.	➔	R d Y

9.6.2 Programming on the V810

P	Press the P key. The first PARAMETER number is displayed.	➔	F – 0 0 0
	Select parameter 513.	➔	F – 5 1 3
E	Press the E key. A request for pressing the shift key is displayed.	➔	[°]
>>	Press the shift key. In case no file is found on the Memory Stick, there will be an error display.	➔	noFiLE
	or File type and number are displayed.	➔	0 1 0 0
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	PUSh-E
E	Confirm within 1 second using the E key. At the end of the deletion process, READY will be displayed.	➔	rEAdY

9.6.3 Programming on the V820

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 513.	➔	F 513
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 513 PdE [°]
F2	Press the F2 key. In case no file is found on the Memory Stick, there will be an error display.	➔	no FiLE
	or File type and number are displayed.	➔	0100 dAtA PAr
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	del PrESS E dAtA
E	Confirm within 1 second using the E key. At the end of the deletion process, READY will be displayed.	➔	rEAdY

9.6.4 Programming on the V850

P	Press the P key. The first PARAMETER number is displayed.	➔	F 000
	Select parameter 513.	➔	F 512 Delete Par..
E	Press the E key. A request for pressing the F2 key is displayed.	➔	F 512 0 F2
F2	Press the F2 key. File type and number are displayed.	➔	0100DATA.PAR
+ -	A different existing filename may be selected using the plus / minus key.		
or			
E	Press the E key. A request for confirmation is displayed.	➔	DELETE PRESS E
E	Confirm within 1 second using the E key. At the end of the deletion process, READY will be displayed.	➔	READ DATA

9.7 Parameter Data Editing on the Memory Stick

Parameter data is stored on the Memory Stick as a text file and can therefore be varied or extended using a text editor on the PC. Comments can be added. The file is stored in the following format:

```
[EFKA FILEINFO=00000001]
F290=5          ** MIN=0        MAX=44        *  Trimming mode
F291=5          ** MIN=0        MAX=19        *  Selection of V810 slide-in strip
•
•
•
F799=0          ** MIN=0        MAX=65535     *

***** Do not change the sequence of parameter ******
*
* File created by:
* CONTROL-TYP:   AB221A
* PRGNR: 5130D
* DATE: Jun 30 2005
* TIME: 09:49:41
```

The first line „ [EFKA FILEINFO=00000001] „ must not be changed! The parameter values may be changed. When reading the file into the control, any text to the right of an " * " will be ignored. This way, the user can input any comment whatsoever into the file.

10 Signal Test

Function **with** or **without** control panel		Parameter
Input and output test	(Sr4)	**173**

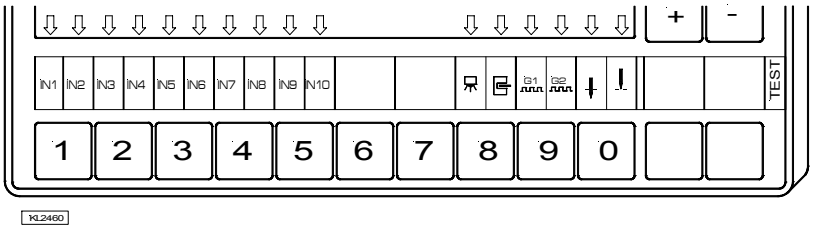
Function test of external inputs and transistor power outputs with connected actuators (e.g. solenoids and solenoid valves).

10.1 Signal Test Using the Incorporated Control Panel or the V810/V820

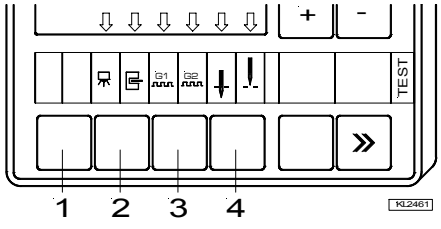
Input Test:

- Select parameter 173.
- **Control:** By actuating the keys or switches connected to inputs in1…i10, the display shows "ON". Several switches and/or keys must not be actuated at the same time. If several keys and/or switches are actuated at the same time, the least significant input will be displayed; if for ex. **in3, in5, in6, in7** are actuated, **in3** will be displayed **as ON**.
- **V810 control panel:** The above signals are indicated by arrows above keys 2...4. Inputs in1...in10 appear individually on the LC display. Several switches and/or keys must not be actuated at the same time (see control).
- **V820 control panel:** Inputs in1...in10 and signals "light barrier, sensor, generator impulse 1 and 2, positions 1 and 2" are displayed by arrows above keys 1...10. Several inputs can be actuated and displayed at the same time. Display e.g.: With in1 2- 07 01 (ST2/7 In1)
- **V850 control panel:** As V820, but with display showing e.g.: ST2/7: IN1 = ON

V820 Control Panel



V810 Control Panel



Note

The input is displayed if the set function includes a normally open [N. O.] or normally closed [N.C.] contact. If, for example, the input with open contact is active, the corresponding arrow lights up when the contact is open. If the input with closed contact is active, the corresponding arrow lights up when the contact is closed.

Output Test:

- Select the desired output using the +/- key
- Enable the selected output using the >> key on the V810 or the incorporated control panel
- Enable the selected output using the key at the bottom right on the V820/V850

Display	Assignment of the outputs	
OUT VR	Backtacking	on socket ST2/34
OUT FL	Sewing foot lift	on socket ST2/35
OUT 01	Output M1	on socket ST2/37
OUT 02	Output M2	on socket ST2/28
OUT 03	Output M3	on socket ST2/27
OUT 04	Output M4	on socket ST2/36
OUT 05	Output M5	on socket ST2/32
OUT 06	Output M6	on socket ST2/30
OUT 07	Output M7	on socket ST2/23
OUT 08	Output M8	on socket ST2/24
OUT 09	Output M9	on socket ST2/25
OUT 10	Output M10	on socket ST2/29
OUT 11	Output M11	on socket ST2/31
OUT 30	Output M30	on socket ST2/15
OUT 31	Output M31	on socket ST2/18
OUT 14	Output M14	on socket ST2/26
OUT 16	Output M16	on socket ST2/20
OUT 17	Output M17	on socket ST2/21
OUT 18	Output M18	on socket ST2/22

On the V810, “OUT1” is displayed as “M1”.

11 Error Displays

General Information			
On the control	**On the V810**	**On the V820/V850**	**Signification**
A1 the	InF A1	InF A1	Pedal not in neutral position when turning machine on
A2	-StoP- blinking	-StoP- blinking + symbol display	Machine run blockage
A3	InF A3	InF A3	Reference position is not set
A4	inF A4	Power OFF/ON	Machine select applied from parameter 280
A5	InF A5	InF A5	Emergency run, identification of an invalid machine select

Programming Functions and Values (Parameters)			
On the control	**On the V810**	**On the V820/V850**	**Signification**
Returns to 000 or to last parameter number	Returns to 0000 or to last parameter number	Like V810 + display InF F1	Wrong code or parameter number input

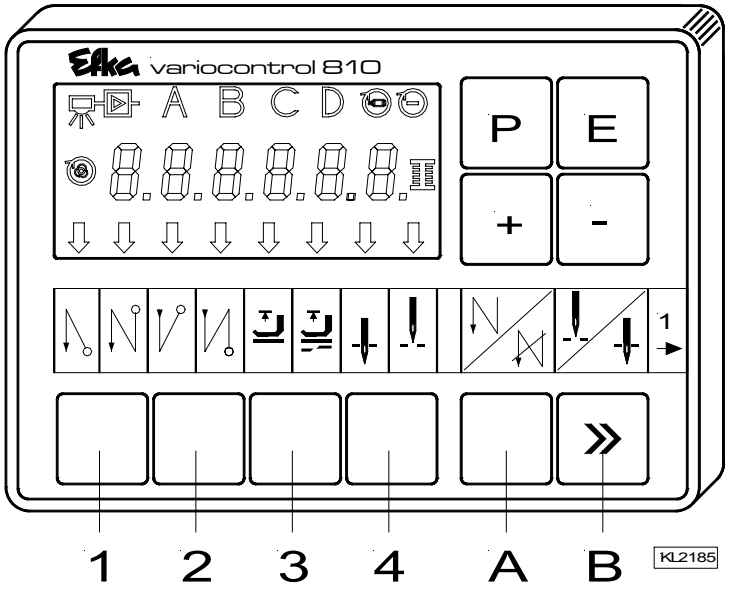
Serious Condition			
On the control	**On the V810**	**On the V820/V850**	**Signification**
E1	InF E1	InF E1	The external pulse encoder e.g. IPG... is defective or not connected.
E2	InF E2	InF E2	Line voltage too low, or time between power Off and power On too short.
E3	InF E3	InF E3	Machine blocked or does not reach the desired speed.
E4	InF E4	InF E4	Control disturbed by deficient grounding or loose contact.
E9	InF E9	InF E9	Defective EEPROM.

Hardware Disturbance			
On the control	**On the V810**	**On the V820/V850**	**Signification**
H1	InF H1	InF H1	Commutation transmitter cord or frequency converter disturbed.
H2	InF H2	InF H2	Processor disturbed

For your notes!

For your notes!

12 Operating Elements of the V810 Control Panel



The V810 control panel is supplied with the **no. 1** slide-in strip above the keys. For different functions the strip can be replaced with another one supplied with the control panel. Set parameter **291** in this case. See also **V810 / V820** instruction manual!

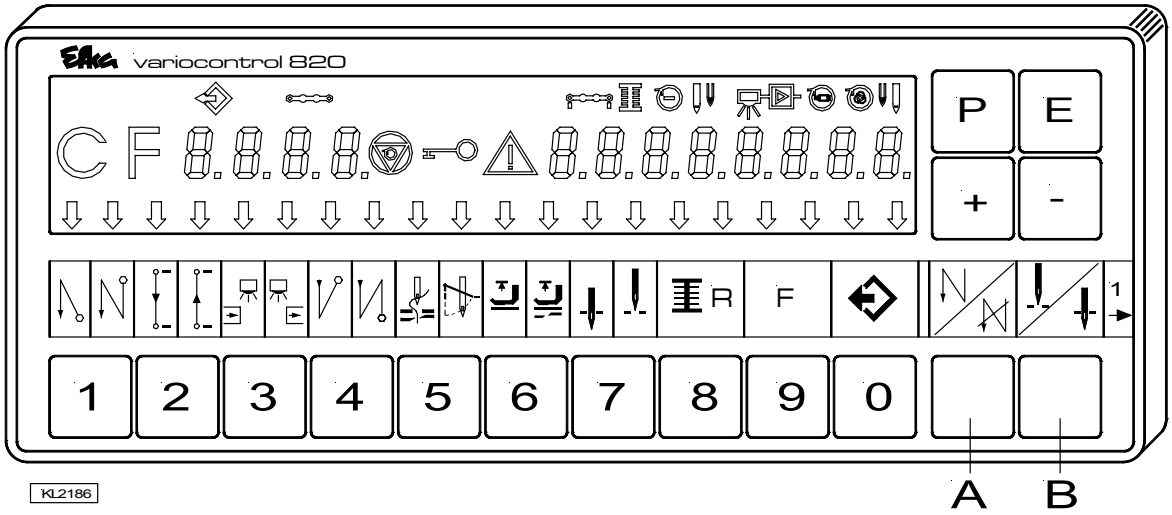
Function Assignment to the Keys

Key P = Call or exit of programming mode
Key E = Enter key for modifications in the programming mode
Key + = Increase of the value indicated in the programming mode
Key - = Decrease of the value indicated in the programming mode

Key 1 = Start backtack SINGLE / DOUBLE / OFF
Key 2 = End backtack SINGLE / DOUBLE / OFF
Key 3 = Automatic sewing foot lift after thread trimming ON / OFF
Automatic sewing foot lift at stop in the seam ON / OFF
Key 4 = Basic position needle down (POSITION 1) / needle up (POSITION 2)

Key A = Key for intermediate backtack
(Different input functions can be assigned to the A key using parameter **293**)
Key B = Key for needle up/down or shift key in the programming mode
(Different input functions can be assigned to the B key using parameter **294**)

13 Operating Elements of the V820 Control Panel



The V820 control panel is supplied with the **no. 1** slide-in strip above the keys. For different functions the strip can be replaced with another one supplied with the control panel. Set parameter **292** in this case. See also **V810 / V820** instruction manual!

Function Assignment to the Keys

Key P = Call or exit of programming mode
Key E = Enter key for modifications in the programming mode
Key + = Increase of the value indicated in the programming mode
Key - = Decrease of the value indicated in the programming mode
Key 1 = Start backtack SINGLE / DOUBLE / OFF
Key 2 = Stitch counting seam FORWARD / BACKWARD / OFF
Key 3 = Light barrier function COVERED-UNCOVERED / UNCOVERED-COVERED / OFF
Key 4 = End backtack SINGLE / DOUBLE / OFF
Key 5 = THREAD TRIMMER / THREAD TRIMMER + THREAD WIPER / OFF
Key 6 = Automatic sewing foot lift after thread trimming ON / OFF
Automatic sewing foot lift at stop in the seam ON / OFF
Key 7 = Basic position needle down (POSITION 1) / needle up (POSITION 2)
Key 8 = Bobbin thread monitor ON / OFF
Key 9 = Function key - programmable
Key 0 = Teach-in / execution of 99 possible seam sections

Key A = Key for backtack suppression/recall
(Different input functions can be assigned to the A key using parameter **293**)
Key B = Key for needle up/down or shift key in the programming mode
(Different input functions can be assigned to the B key using parameter **294**)

Special Key Assignment for HIT

After having pressed key 1, 2, 3, 4 or 9, the following can be varied using the +/- key:

Key 1 = Number of stitches of the selected start backtack
Key 2 = Number of stitches of the seam with stitch counting
Key 3 = Number of light barrier compensating stitches
Key 4 = Number of stitches of the selected end backtack
Key 9 = Number of stitches or On/Off of the programmed function

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